**Matematický ústav SAV**   
   
   
   
   
   
   
   
   
   
   
**Správa o činnosti organizácie SAV**   
**za rok 2021**   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
   
Bratislava   
január 2022

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**1. Základné údaje o organizácii**

**1.1. Kontaktné údaje**   
   
**Názov:** [Matematický ústav SAV](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=27)   
**Riaditeľ:** [doc. RNDr. Karol Nemoga, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2369)   
**Zástupca riaditeľa:** [prof. RNDr. Anatolij Dvurečenskij, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2372)   
**Vedecký tajomník:** [Mgr. Marek Hyčko, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5521)   
**Predseda vedeckej rady:** [Mgr. Anna Jenčová, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2380)   
**Člen Snemu SAV:** [doc. RNDr. Karol Nemoga, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=)   
**Adresa:** Štefánikova 49, 814 73 Bratislava   
   
http://www.mat.savba.sk   
   
**Tel.:** 02/ 5751 0414   
**E-mail:** mathinst@mat.savba.sk   
   
**Názvy a adresy organizačných zložiek a detašovaných pracovísk:**

Organizačné zložky:

 [**Oddelenie aplikovanej matematiky**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=233)   
Štefánikova 49, 81473 Bratislava

Detašované pracoviská:

 [**Oddelenie informatiky Matematického ústavu SAV**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=85)   
Dúbravská cesta 9, 841 04 Bratislava

 [**Detašované pracovisko Matematického ústavu SAV v Košiciach**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=86)   
Grešákova 6, 040 01 Košice

 [**Inštitút matematiky a informatiky MÚ SAV v B. Bystrici**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=92)   
Ďumbierska 1, 974 11 Banská Bystrica

**Vedúci organizačných zložiek a detašovaných pracovísk:**

Organizačné zložky:

 [**Oddelenie aplikovanej matematiky**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=233)   
[RNDr. Tibor Žáčik, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2368)

Detašované pracoviská:

 [**Oddelenie informatiky Matematického ústavu SAV**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=85)   
[doc. Ing. Gabriel Okša, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5701)

 [**Detašované pracovisko Matematického ústavu SAV v Košiciach**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=86)   
[RNDr. Jozef Pócs, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5704)

 [**Inštitút matematiky a informatiky MÚ SAV v B. Bystrici**](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-ins&institute_no=92)   
[prof. RNDr. Roman Nedela, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5699)

**Členovia Snemu SAV za organizačné zložky:**

**Typ organizácie:** Rozpočtová od roku 1959

**1.2. Údaje o zamestnancoch**

Tabuľka 1a Počet a štruktúra zamestnancov

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Štruktúra zamestnancov** | **K** | **K** | | **K  do 35  rokov** | | **F** | **P** | **T** | **O** |
| **M** | **Ž** | **M** | **Ž** |
| **Celkový počet zamestnancov** | 74 | 44 | 30 | 5 | 2 | 66 | 42.81 | 31.23 | 0.93 |
| **Vedeckí pracovníci** | 53 | 39 | 14 | 2 | 2 | 47 | 31.36 | 30.9 | 0 |
| **Odborní pracovníci VŠ**   (výskumní a vývojoví zamestnanci1) | 4 | 3 | 1 | 3 | 0 | 4 | 0.72 | 0.33 | 0.33 |
| **Odborní pracovníci VŠ**   (ostatní zamestnanci2) | 4 | 1 | 3 | 0 | 0 | 2 | 2 | 0 | 0 |
| **Odborní pracovníci ÚS** | 9 | 0 | 9 | 0 | 0 | 9 | 6.04 | 0 | 0.6 |
| **Ostatní pracovníci** | 4 | 1 | 3 | 0 | 0 | 4 | 2.69 | 0 | 0 |

*1 odmeňovaní podľa 553/2003 Z.z., príloha č. 5   
2 odmeňovaní podľa 553/2003 Z.z., príloha č. 3 a č. 4*   
   
*K – kmeňový stav zamestnancov v pracovnom pomere k 31.12.2021 (uvádzať zamestnancov v pracovnom pomere, vrátane riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí, v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)*

*F – fyzický stav zamestnancov k 31.12.2021 (bez riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)*

*P – celoročný priemerný prepočítaný počet zamestnancov*

*T – celoročný priemerný prepočítaný počet riešiteľov projektov*

*O – celoročný priemerný prepočítaný počet obslužného personálu podieľajúceho sa na riešení projektov (technikov, laborantov, projektových manažérov a pod.) mimo zamestnancov v administratíve, správe a údržbe budov, upratovačiek, vodičov a pod.*

*M, Ž – muži, ženy*

Tabuľka 1b Štruktúra vedeckých pracovníkov (kmeňový stav k 31.12.2021)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Rodová skladba** | **Pracovníci s hodnosťou** | | | | **Vedeckí pracovníci v stupňoch** | | |
|  | **DrSc.** | **CSc./PhD.** | **prof.** | **doc.** | **I.** | **II.a.** | **II.b.** |
| **Muži** | 8 | 31 | 8 | 14 | 8 | 13 | 18 |
| **Ženy** | 3 | 12 | 0 | 2 | 3 | 3 | 8 |

Tabuľka 1c Štruktúra pracovníkov podľa veku a rodu, ktorí sú riešiteľmi projektov

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Veková štruktúra (roky)** | **< 31** | | **31-35** | | **36-40** | | **41-45** | | **46-50** | | **51-55** | | **56-60** | | **61-65** | | **> 65** | |
|  | **A** | **B** | **A** | **B** | **A** | **B** | **A** | **B** | **A** | **B** | **A** | **B** | **A** | **B** | **A** | **B** | **A** | **B** |
| **Muži** | 1 | 1.0 | 1 | 1.0 | 3 | 2.2 | 5 | 3.5 | 3 | 0.4 | 4 | 4.0 | 3 | 1.1 | 5 | 4.0 | 9 | 5.5 |
| **Ženy** | 2 | 1.2 | 0 | 0.0 | 1 | 1.0 | 5 | 3.7 | 1 | 1.0 | 2 | 1.0 | 1 | 1.0 | 1 | 1.0 | 2 | 1.1 |

*A - Prepočet bez zohľadnenia úväzkov zamestnancov   
B - Prepočet so zohľadnením úväzkov zamestnancov*   
   
Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2021

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Kmeňoví zamestnanci** | **Vedeckí pracovníci** | **Riešitelia projektov** |
| **Muži** | 53.7 | 55.1 | 55.1 |
| **Ženy** | 52.0 | 49.8 | 49.3 |
| **Spolu** | 53.0 | 53.7 | 53.3 |

**1.3. Iné dôležité informácie k základným údajom o organizácii a zmeny za posledné obdobie (v zameraní, v organizačnej štruktúre a pod.)**

Na základe vnútorného akademického hodnotenia ústavov za r. 2020, Matematický ústav SAV patril aj v r. 2021 medzi najlepšie hodnotené ústavy v SAV vďaka výbornej publikačnej aktivite MÚ SAV.

Začiatkom decembra 2021 prebehla na ústave on-line úspešná obhajoba DrSc. dizertačnej práce Mgr. Andrey Zemánkovej, PhD. s názvom „*The structure of uninorms with continuous underlying triangular norms and conorms and their generalizations*“. Dr. Zemánková ešte čaká na definitívne schválenie titulu DrSc. vo Vedeckej rade SAV.

Kvôli epidémii Covid 19 sme rámci Týždňa vedy nemali 13. ročník Dňa otvorených dverí MÚ SAV, už druhý rok za sebou.

V r. 2016 Mgr. Andrea Zemánková, PhD., ktorá získala prestížny štipendijný program Štipendium SAV pre mladých odborníkov, bola na predĺženej rodičovskej dovolenke, z ktorej sa vrátila v závere r. 2019 a v r. 2021 ho úspešne ukončila. Toto štipendium získali vtedy len traja pracovníci SAV.

V r. 2021 sme pokračovali, hoci v obmedzenej miere kvôli epidemickej situácii, v praxi pre študentov matematiky vyšších ročníkov, v rámci ktorej študenti pod vedením renomovaných odborníkov riešia na ústave zaujímavé úlohy, čím sa jednak oboznamujú s ústavom, jeho úlohami a ústav má nádej medzi nimi objaviť budúcich doktorandov ústavu. Za obmedzených podmienok pôsobila študentka Bc. Radka Schwartzová na našej pobočke v Košiciach pod vedením RNDr. Emílie Haluškovej, CSc.

V lete 2021 jeden uchádzač z Iránu, Dr. O. Zahiri získal štipendium v rámci programu SASPRO 2, nastúpiť by mal v r. 2022, dúfame, že sa to podarí napriek časovej náročnosti získať vízum na Slovensko.

Časopisu Mathematica Slovaca sa zvýšil impaktový faktor z IF(2019)=0,654 na IF(2020)=0,770, päťročný impakt faktor 0,545 a je v 3. kvartile v sekcii matematika. V databáze Scopus má časopis zvýšený z SJR(2019)=0,397 na SJR(2020)=0,445 (Scimago Journal Ranking), Cite Score = 0.9 a je v 3. kvartile. Počet zaslaných článkov v r. 2021 bol okolo 750.

Od r. 2011 je časopis Tatra Mt. Math. Publ. indexovaný v databáze SCOPUS. Jeho SJR=0,171 (Scimago Journal Ranking), Cite Score = 0.6 a je v 3. kvartile**.**

V r. 2021 sa prof. RNDr. Michal Fečkan, DrSc. už druhý krát získal ocenenie Highly Cited Researcher, čo znamená, že sa dostal medzi 1 % najcitovanejších matematikov sveta vo svojom obore, prvý krát to bolo v r. 2019.

V roku 2019 boli schválené dva projekty OP ŠF: 313011T683 - Matematická podpora kvantových technológií, 313011T634 - Výskum v oblasti analýzy heterogénnych dát za účelom predikcie zmeny zdravotného stavu chronických pacientov. V roku 2021 sa pokračovalo v riešení týchto grantov.

V roku 2021 sa schválil legislatívny prechod ústavov SAV s rozpočtovou a príspevkovou formou hospodárenia na verejné výskumné inštitúcie (v. v. i.). Druhý polrok 2021 sa niesol v aktívnych prípravách na prechod na v. v. i. od 1. 1. 2022.

Bohužiaľ, od začiatku marca 2020 celá spoločnosť bola zasiahnutá epidémiou Covid 19, teda aj Matematický ústav SAV, a museli sa rešpektovať protiepidemiologické opatrenia aj druhý rok. Preto sa nekonali konferencie, semináre, obhajoby prezenčnou formou, ale sa prešlo do on-line priestoru, mnohí pracovníci podľa potreby využívali tzv. home office. Je smutnou skutočnosťou, že v januári 2021 zomrel na Covid 19 popredný pracovník MÚ SAV z košickej pobočky doc. RNDr. Roman Frič,  DrSc.

Ing. I. Jadlovská, PhD. bola prijatá na postoktorandskú pozíciu na Detašované pracovisko MÚ SAV v Košiciach pre oblasť matematickej analýzy, štúdium kvalitatívnej teórie riešenia diferenciálnych rovníc.

**2. Vedecká činnosť**

**2.1. Domáce projekty**   
   
Tabuľka 2a Domáce projekty riešené v roku 2021

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ŠTRUKTÚRA PROJEKTOV** | **Počet** | | **Čerpané financie (€)** | | | | | |
| **A** | **B** | **A** | | | | **B** | |
| **Zo zdrojov SAV** | | **Z iných zdrojov** | | **Zo zdrojov SAV** | **Z iných zdrojov** |
| **Spolu** | **Pre  organi-  záciu** | **Spolu** | **Pre  organi-  záciu** |
| **1. Projekty VEGA** | 11 | 3 | 62131 | 58633 | - | - | 3884 | - |
| **2. Projekty APVV** | 3 | 4 | - | - | 41860 | 29551 | - | 16489 |
| **3. Projekty EŠIF/OP ŠF** | 0 | 0 | - | - | - | - | - | - |
| **4. Projekty SASPRO, MoRePro** | 0 | 0 | - | - | - | - | - | - |
| **5. Iné projekty (FM EHP,   Vedecko-technické projekty,   na objednávku rezortov a pod.)** | 1 | 0 | 9375 | 9375 | - | - | - | - |

*A - organizácia je nositeľom projektu*

*B - organizácia sa zmluvne podieľa na riešení projektu*

Tabuľka 2b Domáce projekty podané v roku 2021

|  |  |  |  |
| --- | --- | --- | --- |
| **Štruktúra projektov** | **Miesto podania** | **Organizácia je nositeľom projektu** | **Organizácia sa zmluvne podieľa na riešení projektu** |
| **1. Účasť na nových výzvach APVV**  **r. 2021** | - | - | 3 |
| **2. Projekty výziev EŠIF podané**  **r. 2021** | Bratislava | - | - |
| Regióny | - | - |

**2.2. Medzinárodné projekty**

**2.2.1. Medzinárodné projekty riešené v roku 2021**

Tabuľka 2c Medzinárodné projekty riešené v roku 2021

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ŠTRUKTÚRA PROJEKTOV** | **Počet** | | **Čerpané financie (€)** | | | | | |
| **A** | **B** | **A** | | | | **B** | |
| **Zo zdrojov SAV** | | **Z iných zdrojov** | | **Zo zdrojov SAV** | **Z iných zdrojov** |
| **Spolu** | **Pre  organi-  záciu** | **Spolu** | **Pre  organi-  záciu** |
| **1. Projekty Horizont 2020 a   Horizont Európa** | 0 | 0 | - | - | - | - | - | - |
| **2. Projekty ERA.NET, ESA, JRP** | 0 | 1 | - | - | - | - | - | 8333 |
| **3. Projekty COST** | 0 | 0 | - | - | - | - | - | - |
| **4. Projekty EUREKA, NATO,   UNESCO, CERN, IAEA, IVF,   ERDF a iné** | 0 | 0 | - | - | - | - | - | - |
| **5. Projekty v rámci medzivládnych   dohôd** | 1 | 0 | - | - | 150 | 150 | - | - |
| **6. Bilaterálne projekty MAD,   Mobility, Open Mobility** | 2 | 0 | 2000 | 2000 | - | - | - | - |
| **7. Bilaterálne projekty ostatné** | 0 | 0 | - | - | - | - | - | - |
| **8. Podpora MVTS z národných   zdrojov okrem SAV (APVV a iné)** | 0 | 0 | - | - | - | - | - | - |
| **9. SAS-UPJŠ ERC Visiting   Fellowship Grants** | 0 | 0 | - | - | - | - | - | - |
| **10. Iné projekty** | 0 | 0 | - | - | - | - | - | - |

*A - organizácia je nositeľom projektu*

*B - organizácia sa zmluvne podieľa na riešení projektu*

**2.2.2. Medzinárodné projekty Horizont Európa podané v roku 2021**

Tabuľka 2d Počet projektov Horizont Európa v roku 2021

|  |  |  |
| --- | --- | --- |
|  | **A** | **B** |
| **Počet podaných projektov Horizont Európa** | - | - |

*A - organizácia je nositeľom projektu*

*B - organizácia sa zmluvne podieľa na riešení projektu*

*Údaje k domácim a medzinárodným projektom sú uvedené v Prílohe B.*

**2.2.3. Zámery na čerpanie Európskych štrukturálnych a investičných fondov v ďalších výzvach**

**2.3. Výber najvýznamnejších výsledkov vedeckej práce organizácie v roku 2021**

*Slúži aj na výber výsledkov do výročnej správy SAV. Každý výsledok má byť charakterizovaný stručným, všeobecne zrozumiteľným popisom – maximálne 1000 znakov + 1 obrázok; bibliografický údaj uvádzajte rovnako ako v zozname publikačnej činnosti, vrátane IF. Nadpis by mal vystihnúť prínos a význam výsledku – podľa možnosti by nemal byť zredukovaný na názov/nadpis publikačného výstupu.*

**2.3.1. Výsledky na báze základného výskumu**

**Spektralita v order unit priestoroch.**

Dôležitou vlastnosťou každého matematického modelu kvantovej mechaniky je spektralita, teda existencia spektrálnych rozkladov, ktoré umožňujú vyjadriť efekty ako integrál cez špeciálne prvky, nazývané projekcie. V operačnom prístupe k základom kvantovej mechaniky je fyzikálny systém popísaný pomocou order unit priestoru v dualite s base-normed priestorom, kde prvky vybranej bázy zodpovedajú stavom systému a order unit priestor reprezentuje merania. Asi najznámejším rozšírením pojmu spektrality v tomto kontexte je spektrálna dualita Alfsena a Shultza, založená na geometrických vlastnostiach duálneho páru priestorov. V článku porovnávame túto definíciu s iným, čisto algebraickým prístupom zavedeným Foulisom, ktorý využíva vlastnosti kompresií na usporiadaných grupách s order jednotkou. Je dokázané, že tento druhý prístup je striktne všeobecnejší. Detailne študujeme prípad JB-algebier, kde Alfsen-Shultzova spektralita platí pre JBW-algebry a spektralita v zmysle Foulisa je ekvivalentná Rickartovej vlastnosti, a prípad order unit priestorov konštruovaných z reflexívnych Banachových priestorov, kde Foulisova spektralita zodpovedá hladkosti normy, kdežto Alfsen-Shultzovská spektralita vyžaduje aj striktnú konvexnosť.

**Autori:** **A. Jenčová**, **S. Pulmannová** (MÚ SAV)**,**

**Projekty:** VEGA 2/0142/20, APVV-16-0073.

**Referencia:**

A. Jenčová, S. Pulmannová, *Geometric and algebraic aspects of spectrality in order unit spaces: a comparison*, Journal of Mathematical Analysis and Applications, **504** (2021), Art. Num. 125360. DOI: [10.1016/j.jmaa.2021.125360](https://doi.org/10.1016/j.jmaa.2021.125360)

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**Spectrality in order unit spaces.**

An important property of any mathematical model of quantum mechanics is spectrality, that is, existence of spectral resolutions of effects that allows an integral expression in terms of some special elements called projections. In the operational approach to foundations of quantum mechanics, a physical system is described by an order unit space in duality with a base normed space, where elements of the distinguished base correspond to states of the system and the order unit space describes its measurements. Perhaps the best well known extension of spectrality to this setting is due to Alfsen and Shultz, based on the geometry of the dual pair. In the paper, we compare this definition to a purely algebraic approach due to Foulis, based on properties of compressions on ordered groups with an order unit. We show that the latter approach is strictly more general. In particular, we study in detail the case of JB-algebras, where Alfsen-Shultz spectrality holds for JBW-algebras and spectrality in Foulis sense is proved equivalent to the Rickart property, and the order unit spaces obtained from reflexive Banach spaces, where Foulis spectrality is equivalent to smoothness of the norm, whereas the Alfsen-Shultz spectrality requires also strict convexity.

**Authors:** **A. Jenčová**, **S. Pulmannová** (MI SAS)**,**

**Projects:** VEGA 2/0142/20, APVV-16-0073.

**Reference:**

A. Jenčová, S. Pulmannová, *Geometric and algebraic aspects of spectrality in order unit spaces: a comparison*, Journal of Mathematical Analysis and Applications, **504** (2021), Art. Num. 125360. DOI: [10.1016/j.jmaa.2021.125360](https://doi.org/10.1016/j.jmaa.2021.125360)

**Charakterizácia niektorých tried funkcií, ktoré sa dajú vyjadriť pomocou   
(z-)ordinálneho súčtu a ďalšie vlastnosti (z-)ordinálneho súčtu.**

Charakterizovali sme všetky funkcie, ktoré sa dajú skonštruovať pomocou z-ordinálneho súčtu pologrúp odvodených od spojitých t-noriem, t-konoriem, reprezentovateľných uninoriem a idempotentných pologrúp. Ukázali sme, že táto trieda funkcií zahŕňa všetky komutatívne, asociatívne, neklesajúce binárne funkcie definované na jednotkovom intervale, ktoré majú spojité Archimedovské komponenty a spojitú diagonálu. Našli sme nutné a postačujúce podmienky na to, aby sa uninorma dala vyjadriť ako ordinálny súčet pologrúp definovaných na neprázdnych podintervaloch jednotkového intervalu. Pritom sme zistili, že každá uninorma lokálne internálna na sa dá rozložiť na ordinálny súčet takýchto pologrúp. Ukázali sme jednoznačnosť určenia t-noriem a t-konoriem pomocou ich Archimedovských komponent, nekonečné ordinálne súčty agregačných funkcií, ktoré v jednej forme pokrývajú ordinálne súčty t-noriem aj t-konoriem a popísali kardinalitu príslušných indexových množín. V prípade z-ordinálneho súčtu sme ukázali, že sa vždy dá previesť do základnej redukovanej formy, t.j., takej, kde každá pologroupa, ktorá patrí do vetviacej množiny je triviálna a žiadne dve pologrupy nemajú rovnaké nosiče. Tiež sme popísali kardinalitu minimálnej vetviacej množiny.

**Autor:** **A. Zemánková** (MÚ SAV)

**Projekty:** VEGA 1/0006/19, APVV-16-0073, APVV-20-0069 a Program Štipendium SAV.

**Referencie:**

 A. Mesiarová-Zemánková, R. Mesiar, Y. Su, Ordinal sum constructions for aggregation functions on the real unit interval, Iranian Journal of Fuzzy Systems, prijaté.  
DOI: [10.22111/IJFS.2021.6286](https://doi.org/10.22111/ijfs.2021.6286)

 A. Mesiarová-Zemánková, Commutative, associative and non-decreasing functions continuous around diagonal, Iranian Journal of Fuzzy Systems, prijaté.

 A. Mesiarová-Zemánková, A note on the simplification of the z-ordinal sum construction, Fuzzy Sets and Systems, zaslané (recenzné konanie).

 Y. Su, W. Zong, A. Mesiarová-Zemánková, Constructing uninorms via ordinal sums in the sense of A. H. Clifford, Semigroup Forum, zaslané (recenzné konanie).

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**Characterization of some classed of functions constructed via (z-)ordinal sum and further properties of (z-)ordinal sum**

We characterized all functions that can be obtained as a z-ordinal sum of semigroups related to continuous t-norms, t-conorms, representable uninorms and idempotent semigroups. We showed that this class of functions corresponds to the class of all commutative, associative and non-decreasing binary function on the unit interval, which have continuous Archimedean components and are continuous on the diagonal. We presented sufficient and necessary conditions for obtaining uninorms as an ordinal sum of semigroups with carriers which are non-empty subintervals of the unit interval. We proved that each uninorm locally internal on  can be decomposed into an ordinal sum of such semigroups. Further, we studied the uniqueness of the link between t-norms or t-conorms, and related Archimedean components, we showed infinite ordinal sums of aggregation functions covering by one type of ordinal sums both t-norms and t-conorms ordinal sums and studied the cardinality of the corresponding index sets. For z-ordinal sum we showed that it can always be expressed in the reduced basic form, i.e., that it is enough to assume only trivial semigroups in the branching set and we can always remove semigroups with duplicate carriers. We also investigated the cardinality of the minimal branching set.

**Author:** **A. Zemánková** (MI SAS)

**Projects:** VEGA 1/0006/19, APVV-16-0073, APVV-20-0069 and Program Fellowship of SAS.

**References:**

 A. Mesiarová-Zemánková, R. Mesiar, Y. Su, Ordinal sum constructions for aggregation functions on the real unit interval, Iranian Journal of Fuzzy Systems, to appear. DOI: [10.22111/IJFS.2021.6286](https://doi.org/10.22111/ijfs.2021.6286)

 A. Mesiarová-Zemánková, Commutative, associative and non-decreasing functions continuous around diagonal, Iranian Journal of Fuzzy Systems, submitted (under review).

 A. Mesiarová-Zemánková, A note on the simplification of the z-ordinal sum construction, Fuzzy Sets and Systems, submitted (under review).

 Y. Su, W. Zong, A. Mesiarová-Zemánková, Constructing uninorms via ordinal sums in the sense of A. H. Clifford, Semigroup Forum, submitted (under review).

**Kvantové Rényiho relatívne entropie**

Pojem relatívnej entropie (alebo divergencie) ako miery rozdielnosti dvoch stavov je jedným zo základných pojmov v teórii informácie. Klasické Rényiho relatívne entropie boli zavedené axiomatickým prístupom, ako jediná trieda relatívnych entropií spĺňajúca určité prirodzené vlastnosti. Ukázalo sa, že táto trieda má významné využitie v mnohých úlohách teórie informácie. Avšak pre kvantové systémy existuje viacero rozšírení Rényiho relatívnych entropií. Jednou z týchto verzií, ktoré sa ukázali užitočnými v prípade konečnorozmerných systémov, je trieda sandwiched Rényiho entropií. V článku rozširujeme túto triedu na normálne stavy ľubovoľnej von Neumannovej algebry a dokazujeme niektoré jej vlastnosti, ako aj fakt, že sa dá definovať pomocou interpolačných Kosakiho nekomutatívnych Lp-priestorov. Taktiež je dokázané, že pre všetky relevantné hodnoty parametra sú tieto veličiny nerastúce vzhľadom na unitálne normálne pozitívne zobrazenia, čo bolo doteraz známe len pre úplne pozitívne zobrazenia alebo pre obmedzenú škálu hodnôt parametra. Tiež sa zaoberáme situáciou keď nejaké takéto zobrazenie zachováva niektorú z týchto veličín pre dané dva stavy a dokazujeme, že toto nastane práve vtedy, keď sa dané stavy dajú plne rekonštruovať.

**Autor:** **A. Jenčová** (MÚ SAV)

**Projekty:** VEGA 2/0142/20, APVV-16-0073

**Referencia:**

A. Jenčová, *Rényi relative entropies an noncommutative Lp-spaces* II, Annales Henri Poincaré **22** (2021), 3235–3254. DOI: [10.1007/s00023-021-01074-9](https://doi.org/10.1007/s00023-021-01074-9)

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**Quantum Rényi relative entropies**

The concept of a relative entropy (or divergence) as a measure of informational dissimilarity of states is fundamental in information theory. The classical Rényi relative entropies were introduced by an axiomatic approach as the unique family of divergences satisfying certain natural properties. As it turned out, these quantities play a central role in many information-theoretic tasks. However, there are many possible versions of Rényi relative entropies for quantum systems. One of the versions that have proved useful for finite dimensional systems is the family of sandwiched Rényi relative entropies. In this paper, we extend this family to normal states of an arbitrary von Neumann algebra and show some of its properties, in particular that it can be obtained from an interpolating family of noncommutative Kosaki Lp-spaces. We also show that for all relevant values of the parameter, these quantities are nonincreasing under unital normal positive maps, which was previously known only for completely positive maps or for restricted values of the parameter. We also discuss the situation when some of these quantities is preserved under such a map for a given pair of states and show that if the map is 2-positive, this happens if and only if the two states can be fully recovered.

**Authors:** **A. Jenčová** (MI SAS)

**Projects:** VEGA 2/0142/20, APVV-16-0073

**Reference:**

A. Jenčová, *Rényi relative entropies an noncommutative Lp-spaces* II, Annales Henri Poincaré **22** (2021), 3235–3254. DOI: [10.1007/s00023-021-01074-9](https://doi.org/10.1007/s00023-021-01074-9)

**O Mahlerovej hypotéze**

Podľa Mahlerovej hypotézy neexistuje číslo také, že necelá časť postupnosti je menšia ako pre každé . Ak také existuje, potom má postup–nosť asymptotickú distribučnú funkciu , pre . Výsledok vyplýva z explicitného tvaru integrálu

kde je distribučná funkcia a je suma zložená z absolútnych hodnôt necelých častí s použitím Youngovho integrálu.

**Autor:** **O. Strauch** (MÚ SAV)

**Projekty:** VEGA 2/0109/18

**Referencia:**

O. Strauch, *Mahler's conjecture on ξ(3/2)n  mod 1*, Unif. Distrib. Theory **16** (2021), no. 2, 49–70. DOI: [10.2478/udt-2021-0007](https://doi.org/10.2478/udt-2021-0007)

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**On Mahler's conjecture**

Mahler's conjecture states that there exists no such real number that the fractional parts of the sequence satisfy for all . If such exists, then has an asymptotic distribution function for . For the proof we used the integral explicit formula of integral

for distribution function , where is the sum of absolute values of fractional parts . For proof we used Young's integral.

**Authors:** **O. Strauch** (MI SAS)

**Projects:** VEGA 2/0109/18

**Reference:**

O. Strauch, *Mahler's conjecture on ξ(3/2)n  mod 1*, Unif. Distrib. Theory **16** (2021), no. 2, 49–70. DOI: [10.2478/udt-2021-0007](https://doi.org/10.2478/udt-2021-0007)

**2.3.2. Výsledky aplikačného typu**

**Dvojrozmerná lineárna porovnávacia kalibrácia**

Navrhujeme nový kalibračný model založený na lineárnej kalibračnej funkcii porovnaní dvoch meracích prístrojov – každý meria dvojrozmerné merania s normálne rozdelenými chybami. Zo štatistického hľadiska je uvažovaný kalibračný model nelineárny v parametroch modelu, avšak po vhodnej linearizácii je možné model reprezentovať pomocou modelu s chybami v premenných (EIV). Navrhuje sa iteračný algoritmus na odhad parametrov lineárnej kalibračnej funkcie a ukazujeme približnú oblasti spoľahlivosti pre parametre kalibračnej funkcie. Taktiež popisujeme proces merania a štatistické vlastnosti meraní kalibrovaným meradlom.

**Autori:** **G. Wimmer** (MÚ SAV), V. Witkovský (ÚM SAV), K. Žáková Myšková (Masarykova univ., Brno)

**Projekty:** APVV-15-0295, VEGA 2/0054/18, VEGA 2/0081/19

**Referencia:**

G. Wimmer, V. Witkovský, K. Žáková Myšková, *Two-dimensional linear comparative calibration*, Perspectives in Measurement, Modeling and Interpretation. - Bratislava, Slovakia: Vysoká škola manažmentu/City University of Seattle programs, 2020, 15–37. ISBN 978-80-89306-54-1.

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**Two-dimensional linear comparative calibration**

We propose a new calibration model with linear calibration function, based on comparison of two measuring devices – each is measuring two-dimensional measurements with normally distributed errors. From statistical point of view, the considered calibration model is nonlinear in the model parameters, however, after proper linearization, the model can be represented by the linear errors-in-variables (EIV) model. Based on that, we suggest an iterative algorithm for estimating the parameters of the linear calibration function and present the approximate confidence region for the calibration function parameters. Finally, we describe the measuring process and statistical properties of the measurements realized with the calibrated device.

**Authors:** **G. Wimmer** (MI SAS), V. Witkovský (IMS SAS), K. Žáková Myšková (Masarykova univ., Brno, Czech. Rep.)

**Projects:** APVV-15-0295, VEGA 2/0054/18 , VEGA 2/0081/19

**Reference:**

G. Wimmer, V. Witkovský, K. Žáková Myšková, *Two-dimensional linear comparative calibration*, Perspectives in Measurement, Modeling and Interpretation. - Bratislava, Slovakia: Vysoká škola manažmentu/City University of Seattle programs, 2020, 15–37. ISBN 978-80-89306-54-1.

**Popis exponenciálnej fázy epidémie COVID-19**

Na popis exponenciálnej fázy epidémie COVID-19 sme použili populačný maticový model. Tento model sme rozšírili tak, aby dokázal popísať aj periodické hromadné testovanie rýchlymi antigénovými testami. Skúmali a porovnávali sme rôzne spôsoby rozloženia testov v čase: napríklad testovanie celej populácie len v jednom dni týždňa oproti rovnomernému testovaniu počas celého týždňa, a podobne. Okrem toho sme hľadali také časové rozloženie testovanej populácie, pri ktorom sa dosahoval maximálny, prípadne minimálny účinok na priebeh epidémie. Tento účinok sa kvôli izolácii pozitívne testovaných prejavuje na znížení aktuálneho reprodukčného čísla. Ukázali sme, že pri senzitivite dostupných testov a reálne dosiahnuteľnej účasti populácie na rôznych typoch periodických testovaní, sa dosiahne rozdiel reprodukčných čísiel nie väčší ako 2 %. Z toho vyplýva, že pri praktickej realizácii hromadného testovania je rozumné uprednostniť logisticky menej náročné priebežné testovanie počas celého týždňa pred hromadným testovaním počas víkendov.

**Autori:** **I. Mračka**, **M. Hyčko**, **R. Hajossy**, **I. Odrobina**, **T. Žáčik** (MÚ SAV)

**Projekt:** Ústavný projekt.

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**Description of the exponential phase of the COVID-19 epidemic**

We used a population matrix model to describe the exponential phase of the COVID-19 epidemic. We have extended this model so that it can also describe periodic mass testing followed by isolation of positive cases. We researched and compared different ways of distributing tests over time: for example, testing the entire population on one day of the week only versus evenly distributed testing throughout the whole week, and so on. In addition, we looked for a distribution of those tested in which the maximum or minimum effect on the course of the epidemic was achieved. Due to the isolation of the positive tested, this effect results in a reduction of the current reproductive number. We have shown that with the sensitivity of the available rapid antigen tests and the real achievable participation of the population in different types of periodic testing, a difference in reproductive numbers of no more than 2 % is achieved. It follows that in the practical implementation of mass testing, it is reasonable to prioritize less logistically demanding continuous testing throughout the week over bulk testing on weekends.

**Authors:** **I. Mračka**, **M. Hyčko**, **R. Hajossy**, **I. Odrobina**, **T. Žáčik** (MI SAS)

**Project:** Institutional project.

**Aplikácie matematickej štatistiky pri analýze jazyka a textu**

Boli získané nové výsledky pri diachrónnej analýze češtiny, kde sa pomocou štatistických analýz rozlišovali vlastnosti, ktoré sa pri vývoji jazyka menia, a tie, ktoré zostávajú invariantné. Na základe výsledkov analýzy zhlukov aplikovanej na najfrekventovanejšie slová bol dosiahnutý postup pri riešení otázky autorstva niektorých starších českých rukopisov. Synergetický model jazyka bol rozvinutý aj pre nižšie jazykové jednotky (slabiky, morfémy). Boli skúmané predovšetkým vzťahy medzi ich vlastnosťami a vlastnosťami slov.

**Autori:** **J. Mačutek** (MÚ SAV), R. Čech (Univ. Ostrava), P. Kosek,   
O. Navrátilová (Masaryk Univ. Brno), etc.

**Projekt:** VEGA 2/0096/21

**Referencie:**

 R. Čech, P. Kosek, J. Mačutek, M. Nogolová, *(Ne)stabilita českého biblického překladu: diachronní stylometrická analýza*, Clavibus unitis, 2021, vol. 10, no. 2, 151–156. ISSN 1803-7747.

 R. Čech, J. Mačutek, P. Kosek, *Czech translations of the Gospel of Matthew from the diachronic point of view – Plus ça change…*, Jazykovedný časopis, 2021, roč. 72, č. 2, s. 656–666. DOI: [10.2478/jazcas-2021-0059](https://doi.org/10.2478/jazcas-2021-0059)

 R. Čech, P. Kosek, O. Navrátilová, J. Mačutek, *On the impact of the initial phrase length on the position of enclitics in Old Czech*, Language and Text: Data, models, information and applications. - Amsterdam : John Benjamin Publishing Company, 2021, p. 9–20. ISBN 978-90-272-1010-4. DOI: [10.1075/cilt.356.01cec](https://doi.org/10.1075/cilt.356.01cec)

 M. Kubát, Š. Netolická, R. Čech, J. Mačutek, *Martin of Cochem´s Golden Key of Heaven and its Czech Relatives: Quantitative Analysis of Baroque Prayers*,Bohemistyka, 2021, vol. 3, p. 283–294. ISSN 1642-9893.  
DOI: [10.14746/bo.2021.3](https://doi.org/10.14746/bo.2021.3).

 K. Pelegrinová, J. Mačutek, R. Čech, *The Menzerath-Altmann law as the relation between lengths of words and morphemes in Czech*, In Jazykovedný časopis, 2021, roč. 72, č. 2, s. 405–414. ISSN 0021-5597. DOI: [10.2478/jazcas-2021-0037](https://doi.org/10.2478/jazcas-2021-0037)

 B. Rujevic, M. Kaplar, S. Kaplar, R. Stankovic, I. Obradovic, J. Mačutek, *Quantitative analysis of syllable properties in Croatian, Serbian, Russian, and Ukrainian* Language and Text: Data, models, information and applications. - Amsterdam: John Benjamin Publishing Company, 2021, p. 55–67. ISBN 978-90-272-1010-4.   
DOI: [10.1075/cilt.356.04ruj](https://doi.org/10.1075/cilt.356.04ruj)

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**Applications of mathematical statistics in analyses of language and text**

New results were obtained in diachronic analysis of Czech. Using statistical analyses, language properties which undergo change in diachronic development were distinguished from those which remain invariant. Based on cluster analysis of the most frequent words, some progress was achieved at solving the problem of authorship of older Czech manuscripts. A synergetic language model was developed also for lower language units (syllables, morphemes). Relations between their properties and properties of words were investigated.

**Authors:** **J. Mačutek** (MI SAS), R. Čech (Univ. Ostrava), P. Kosek,   
O. Navrátilová (Masaryk Univ. Brno), etc.

**Project:** VEGA 2/0096/21

**References:**

 R. Čech, P. Kosek, J. Mačutek, M. Nogolová, *(Ne)stabilita českého biblického překladu: diachronní stylometrická analýza*, Clavibus unitis, 2021, vol. 10, no. 2, 151–156. ISSN 1803-7747.

 R. Čech, J. Mačutek, P. Kosek, *Czech translations of the Gospel of Matthew from the diachronic point of view – Plus ça change…*, Jazykovedný časopis, 2021, roč. 72, č. 2, s. 656–666. DOI: [10.2478/jazcas-2021-0059](https://doi.org/10.2478/jazcas-2021-0059)

 R. Čech, P. Kosek, O. Navrátilová, J. Mačutek, *On the impact of the initial phrase length on the position of enclitics in Old Czech*, Language and Text: Data, models, information and applications. - Amsterdam : John Benjamin Publishing Company, 2021, p. 9–20. ISBN 978-90-272-1010-4. DOI: [10.1075/cilt.356.01cec](https://doi.org/10.1075/cilt.356.01cec)

 M. Kubát, Š. Netolická, R. Čech, J. Mačutek, *Martin of Cochem´s Golden Key of Heaven and its Czech Relatives: Quantitative Analysis of Baroque Prayers*,Bohemistyka, 2021, vol. 3, p. 283–294. ISSN 1642-9893. DOI: [10.14746/bo.2021.3](https://doi.org/10.14746/bo.2021.3).

 K. Pelegrinová, J. Mačutek, R. Čech, *The Menzerath-Altmann law as the relation between lengths of words and morphemes in Czech*, In Jazykovedný časopis, 2021, roč. 72, č. 2, s. 405–414. ISSN 0021-5597. DOI: [10.2478/jazcas-2021-0037](https://doi.org/10.2478/jazcas-2021-0037)

 B. Rujevic, M. Kaplar, S. Kaplar, R. Stankovic, I. Obradovic, J. Mačutek, *Quantitative analysis of syllable properties in Croatian, Serbian, Russian, and Ukrainian* Language and Text: Data, models, information and applications. - Amsterdam: John Benjamin Publishing Company, 2021, p. 55–67. ISBN 978-90-272-1010-4.   
DOI: [10.1075/cilt.356.04ruj](https://doi.org/10.1075/cilt.356.04ruj)

**2.3.3. Výsledky na báze medzinárodnej spolupráce**

**O konvergencii vlastných hodnôt a vlastných vektorov v blokovom Jacobiho EVF algoritme s dynamickým usporiadaním**

V blokovej verzii klasického variantu dvojstrannej Jacobiho metódy pre výpočet vlastných čísiel a vektorov hermitovských matíc konverguje mimo diagonálna časť iterovanej matice k nule. To však nutne neznamená, že iterovaná matica konverguje k jednoznačne danej diagonálnej matici. To isté platí pre maticu akumulovaných unitárnych transformácií. Dokázali sme, že iterovaná matica naozaj konverguje k pevnej diagonálnej matici, ktorej diagonálne prvky sú vlastné čísla pôvodnej matice. Ďalej sme ukázali, že pre jednoduché vlastné čísla konverguje príslušný stĺpec matice akumulovaných unitárnych transformácií k vlastnému vektoru. Pre viacnásobné vlastné číslo resp. klaster vlastných čísiel sme dokázali konvergenciu ortogonálnych projektorov, ktoré sú definované príslušnými stĺpcami matice akumulovaných unitárnych transformácií, k ortogonálnemu projektoru na vlastný podpriestor prislúchajúci k daným vlastným číslam. Súčasťou dôkazov sú horné hranice pre rýchlosť konvergencie. Dôkazy konvergencie platia i pre paralelný blokový Jacobiho algoritmus s dynamickým usporiadaním subproblémov. Teoretické výsledky boli ilustrované numerickým príkladom.

**Autori:** Y. Yamamoto (University of Electro-Communications, Tokyo), **G. Okša**, **M. Vajteršic** (MÚ SAV)

**Projekty:** VEGA 2/0015/20

**Referencia:**

Y. Yamamoto, G. Okša, M. Vajteršic, *On convergence to eigenvalues and eigenvectors in the block-Jacobi EVD algorithm with dynamic ordering*, Linear Algebra and Its Applications **622** (2021), 19–45. DOI: [10.1016/j.laa.2021.03.027](https://doi.org/10.1016/j.laa.2021.03.027)

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**On convergence of eigenvalues and eigenvectors in the block-Jacobi EVD algorithm with dynamic ordering**

In the block version of the classical two-sided Jacobi method for the Hermitian eigenvalue problem, the off-diagonal elements of iterated matrix converge to zero. However, this fact alone does not necessarily guarantee that this matrix converges to a fixed diagonal matrix. The same is true for the matrix of accumulated unitary transformations. We have proved that under certain assumptions the iterated matrix indeed converges to a fixed diagonal matrix, whose diagonal elements are the eigenvalues of the input matrix. Next it was shown that for a simple eigenvalue the corresponding column of the accumulated matrix of unitary transformations converges to the corresponding eigenvector. For a multiple eigenvalue or a cluster of eigenvalues, we proved that the orthogonal projectors constructed from the corresponding columns of the accumulated matrix of unitary transformations converge to the orthogonal projector onto the eigenspace corresponding to those eigenvalues. Moreover, the appropriate convergence bounds were obtained for all discussed cases. Convergence results are also valid for the parallel block-Jacobi method with dynamic ordering. The developed theory is illustrated by numerical example.

**Authors:** Y. Yamamoto (University of Electro-Communications, Tokyo), **G. Okša**, **M. Vajteršic** (MI SAS)

**Projects:** VEGA 2/0015/20

**Reference:**

Y. Yamamoto, G. Okša, M. Vajteršic, *On convergence to eigenvalues and eigenvectors in the block-Jacobi EVD algorithm with dynamic ordering*, Linear Algebra and Its Applications **622** (2021), 19–45. DOI: [10.1016/j.laa.2021.03.027](https://doi.org/10.1016/j.laa.2021.03.027)

**Mocnina, pozitívny uzáver a kvocienty na konvexných jazykoch**

Študujeme stavovú zložitosť a nedeterministickú stavovú zložitosť -tej mocniny, pozitívneho uzáveru, pravého kvocientu a ľavého kvocientu na triedach bezpredponových, bezpríponových, bezfaktorových, bezpodslovových, ďalej predponovo, príponovo, faktorovo a podslovovo uzavretých a konvexných regulárnych jazykov, a na triedach pravo, ľavo, obojstranne a všetkostranne ideálnych jazykov. Ukazujeme, že nedeterministická stavová zložitosť -tej mocniny je pre uzavreté a konvexné jazyky a v ostatných triedach, zatiaľ čo jej (deterministická) stavová zložitosť je pre pravé ideály, pre ostatné ideály a faktorovo a podslovovo uzavreté jazyky, a pre jazyky neobsahujúce predpony, faktory a podslová. Ďalej ukazujeme, že nedeterministická stavová zložitosť pozitívneho uzáveru je pre faktorovo a podslovovo uzavreté jazyky a pre všetky ostatné triedy, zatiaľ čo jeho stavová zložitosť je pre faktorovo a podslovovo uzavreté jazyky, pre predponovo uzavreté a bezpríponové jazyky, a pre všetky ostatné uvažované triedy. Okrem toho, študujú sa kvocienty na konvexných jazykoch.

**Autori:** **M. Hospodár** (MÚ SAV), M. Holzer (Universität Giessen)

**Projekty:** VEGA 2/0132/19, APVV-15-0091

**Referencia:**

M. Holzer, M. Hospodár, *Power, positive closure, and quotients on convex languages*, Theoretical Computer Science, **870** (2021), 53–74. DOI: [10.1016/j.tcs.2021.02.002](https://doi.org/10.1016/j.tcs.2021.02.002)

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**Power, positive, closure, and quotients on convex languages**

We study the state complexity and nondeterministic state complexity of the -th power, positive closure, right quotient, and left quotient on the classes of prefix-, suffix-, factor-, and subword-free, -closed, and -convex regular languages, and on the classes of right, left, two-sided, and all-sided ideal languages. We show that the nondeterministic state complexity of the -th power is kn for closed and convex languages, and in the remaining classes, while its state complexity is for right ideals, for other ideals and factor- and subword-closed languages, and for prefix-, factor-, and subword-free languages. We next prove that the nondeterministic state complexity of positive closure is for factor- and subword-closed languages and for all other classes, while its state complexity is for factor- and subword-closed languages, for prefix-closed and suffix-free languages, and for all other considered classes. Besides, we study quotients on convex languages.

**Authors:** **M. Hospodár** (MÚ SAV), M. Holzer (Universität Giessen)

**Projects:** VEGA 2/0132/19, APVV-15-0091

**Reference:**

M. Holzer, M. Hospodár, *Power, positive closure, and quotients on convex languages*, Theoretical Computer Science, **870** (2021), 53–74. DOI: [10.1016/j.tcs.2021.02.002](https://doi.org/10.1016/j.tcs.2021.02.002)

**USCO a kvázispojité zobrazenia**

V monografii sú uvedené dve prirodzené zovšeobecnenia spojitých zobrazení, a to USCO zobrazenía a kvázispojité zobrazenia. Prvá trieda uvažuje množinovo-hodnotové zobrazenia, druhá trieda zoslabuje definíciu spojitosti. Oba tieto topologické pojmy vyplývajú prirodzene zo základných matematických úvah a majú početné aplikácie, ktoré sú v knihe podrobne popísané.

Kniha je vhodná pre vedeckých pracovníkov, ktorí sa chcú dozvedieť o USCO a kvázispojitých zobrazeniach.

Kniha uvádza najvýznamnejšie výsledky v tejto oblasti aj s ich aplikáciami.

**Autori:** **Ľ. Holá** (MÚ SAV), D. Holý (Univ. Trnava) and W. Moors (Univ. Auckland, New Zeeland)

**Projekt:** VEGA 2/0006/16

**Referencia:**

Ľ. Holá, D. Holý, W. Moors, *USCO and Quasicontinuous Mappings*, De Gruyter Studies in Matematics Volume **81**, 2021, pp. viii + 298 pages. ISBN 978-31-1075-015-7, ebook 978-31-1075-018-8. DOI: [10.1515/9783110750188](https://doi.org/10.1515/9783110750188)

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**USCO and Quasicontinuous Mappings**

This book presents two natural generalizations of continuous mappings, namely usco and quasicontinuous mappings. The first class considers set-valued mappings, the second class relaxes the definition of continuity. Both these topological concepts stem naturally from basic mathematical considerations and have numerous applications that are covered in detail.

It is accessible to researchers who want to learn about Usco and Quasicontinuous mappings.

The book presents the most significant results in the field with applications.

**Autors:** **Ľ. Holá** (MI SAS), D. Holý (Univ. Trnava) and W. Moors (Univ. Auckland, New Zeeland)

**Project:** VEGA 2/0006/16

**Reference:**

Ľ. Holá, D. Holý, W. Moors, *USCO and Quasicontinuous Mappings*, De Gruyter Studies in Matematics Volume **81**, 2021, pp. viii + 298 pages. ISBN 978-31-1075-015-7, ebook 978-31-1075-018-8. DOI: [10.1515/9783110750188](https://doi.org/10.1515/9783110750188)

**Periodické riešenia v pomaly meniacich sa diferenciálnych rovniciach**

Študuje sa zachovanie periodických riešení pre perturbované nespojité diferenciálne rovnice s malým parametrom, ktorý reprezentuje pomaly sa meniacu premennú. Predpokladá sa, že neperturbovaná (zamrznutá) diferenciálna rovnica má nesingulárne periodické riešenie. Výsledky tohto článku sú motivované dvojrozmernými systémami Hamiltonových diferenciálnych rovníc závislých od skalárnej premennej, ktorá je riešením singulárne perturbovanej diferenciálnej rovnice. Sú odvodené postačujúce podmienky pre bifurkácie periodických riešení. Teória je použitá na konkrétny 3 rozmerný systém diferenciálnych rovníc s nespojitou zložkou modelujúca tzv. suché trenie alebo prepínanie.

**Autori:** **M. Fečkan** (MÚ SAV), F. Battelli (Polytech., Ancona, Italy)

**Projekt:** APVV-18-0308, VEGA 1/0358/20, VEGA 2/0127/20

**Referencia:**

F. Battelli, M. Fečkan, *Periodic solutions in slowly varying discontinuous differential equations: the generic case*, Mathematics **9** (19) (2021), Art. Num. 2449.

DOI: [10.3390/math9192449](https://doi.org/10.3390/math9192449)

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**Periodic solutions in slowly varying discontinuous differential equations**

We study persistence of periodic solutions of perturbed discontinuous differential equations with a small parameter, which represents a slowly varying variable. We assume that the unperturbed (frozen) differential equation has a non-singular periodic solution. The results of this paper are motivated by two dimensional systems of Hamiltonian differential equations depending on a scalar variable, which is the solution of a singularly perturbed equation. Sufficient conditions for bifurcations of periodic solutions are derived. The theory is applied to a specific 3-dimensional system of differential equations with a discontinuous component modeling the so-called dry friction or switching.

**Autors:** **M. Fečkan** (MI SAS), F. Battelli (Polytech., Ancona, Italy)

**Projects:** APVV-18-0308, VEGA 1/0358/20, VEGA 2/0127/20

**Reference:**

F. Battelli, M. Fečkan, *Periodic solutions in slowly varying discontinuous differential equations: the generic case*, Mathematics **9** (19) (2021), Art. Num. 2449.

DOI: [10.3390/math9192449](https://doi.org/10.3390/math9192449)

**2.4. Publikačná činnosť** (zoznam je uvedený v prílohe C)

Tabuľka 2e Štatistika vybraných kategórií publikácií

|  |  |
| --- | --- |
| **PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ** | **Počet v r. 2021/ doplnky z r. 2020** |
| **1. Vedecké monografie a monografické štúdie vydané v domácich   vydavateľstvách** (AAB, ABB) | **0 / 0** |
| **2. Vedecké monografie a monografické štúdie vydané v zahraničných   vydavateľstvách** (AAA, ABA) | **1 / 0** |
| **3. Odborné monografie, vysokoškolské učebnice a učebné texty vydané   v domácich vydavateľstvách** (BAB, ACB, CAB) | **1 / 0** |
| **4. Odborné monografie a vysokoškolské učebnice a učebné texty vydané   v zahraničných vydavateľstvách** (BAA, ACA, CAA) | **0 / 0** |
| **5. Kapitoly vo vedeckých monografiách vydaných v domácich   vydavateľstvách** (ABD) | **0 / 0** |
| **6. Kapitoly vo vedeckých monografiách vydaných v zahraničných   vydavateľstvách** (ABC) | **0 / 0** |
| **7. Kapitoly v odborných monografiách, vysokoškolských učebniciach   a učebných textoch vydaných v domácich vydavateľstvách** (BBB, ACD) | **0 / 0** |
| **8. Kapitoly v odborných monografiách, vysokoškolských učebniciach   a učebných textoch vydaných v zahraničných vydavateľstvách**   (BBA, ACC) | **0 / 0** |
| **9. Vedecké práce registrované v Current Contents Connect**   (ADCA, ADCB, ADDA, ADDB) | **45 / 1** |
| **10. Vedecké práce registrované vo Web of Science Core Collection alebo   Scopus** (ADMA, ADMB, ADNA, ADNB) | **18 / 3** |
| **11. Vedecké práce v ostatných domácich časopisoch**   (ADFA, ADFB) | **2 / 0** |
| **12. Vedecké práce v ostatných zahraničných časopisoch**   (ADEA, ADEB) | **10 / 1** |
| **13. Vedecké práce v domácich recenzovaných zborníkoch**   (AEDA) | **0 / 1** |
| **14. Vedecké práce v zahraničných recenzovaných zborníkoch**   (AECA) | **5 / 0** |
| **15. Publikované príspevky na domácich vedeckých konferenciách**   (AFB, AFD) | **0 / 0** |
| **16. Publikované príspevky na zahraničných vedeckých konferenciách**   (AFA, AFC) | **3 / 0** |
| **17. Vydané periodiká evidované v CCC, WoS Core Collection, SCOPUS** | **2** |
| **18. Ostatné vydané periodiká** | **1** |
| **19. Zostavovateľské práce knižného charakteru**   (FAI) | **1 / 1** |
| **20. Preklady vedeckých a odborných textov**   (EAJ) | **0 / 0** |
| **21. Heslá v odborných terminologických slovníkoch a encyklopédiách**   (BDA, BDB) | **0 / 0** |
| **22. Recenzie v časopisoch a zborníkoch**   (EDI) | **0 / 0** |

*Evidujú sa len tie práce zamestnancov a doktorandov, v ktorých je uvedená afiliácia k organizácii*

Tabuľka 2f Štatistika vedeckých prác podľa kvartilu vedeckého časopisu

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Kvartil vedeckého časopisu** | **Q1** | **Q2** | **Q3** | **Q4** | **Spolu** |
| **Podľa IF z r. 2020 (zdroj JCR)**   *Počet článkov / doplnky* | 20 / 0 | 15 / 0 | 12 / 0 | 3 / 2 | 50 / 2 |
| **Podľa SJR z r. 2020 (zdroj Scimago)**   *Počet článkov / doplnky* | 24 / 0 | 22 / 0 | 8 / 2 | 8 / 2 | 62 / 4 |

Tabuľka 2g Ohlasy

|  |  |
| --- | --- |
| **OHLASY** | **Počet v r. 2020/ doplnky z r. 2019** |
| **Citácie vo WOS (1.1, 2.1)** | 859 / 0 |
| **Citácie v SCOPUS (1.2, 2.2)** | 217 / 0 |
| **Citácie v iných citačných indexoch a databázach (9, 10,   3.2, 4.2)** | 0 / 0 |
| **Citácie v publikáciách neregistrovaných v citačných   indexoch (3, 4, 3.1, 4.1)** | 19 / 1 |
| **Recenzie na práce autorov z organizácie (5, 6, 7, 8)** | 0 / 0 |

**2.5. Aktívna účasť na vedeckých podujatiach**

Tabuľka 2h Vedecké podujatia

|  |  |
| --- | --- |
| **Prednášky a vývesky na medzinárodných vedeckých podujatiach** | 25 |
| **Prednášky a vývesky na národných vedeckých podujatiach** | 3 |

**Účasť a vedenie seminárov**

**Interný seminár o výsledkoch detašovaného pracoviska MÚ SAV v Košiciach**

**stránka:** [**https://im.saske.sk/sk/seminar.html**](https://im.saske.sk/sk/seminar.html)

**Vedúci:** J. Pócs

**Referáty:** J. Pócs, I. Jadlovská, M. Repický, V. Olejár

**Účasť:** P. Eliaš, J. Haluška, E. Halušková, M. Hospodár, G. Jirásková, P. Mlynárčik

**Seminár z kvantových logík**

**Vedúci:** A. Dvurečenskij, S. Pulmannová

**Poznámka:** Pre nepriaznivú situáciu ohľadom COVID-19 nebol seminár aktívny.

**Set-Valued Analysis**

**Vedúci:** Ľ. Holá

**Poznámka:** Pre nepriaznivú epidemickú situáciu sa seminár v roku 2021 neuskutočňoval.

**Seminár o automatoch na MÚ SAV v Košiciach**

**Vedúci:** G. Jirásková

**Referáty:** M. Hospodár, V. Olejár

**Účasť:** P. Mlynárčik

**Seminár z topológie a teórie množín na PF UPJŠ**

**Vedúci:** J. Šupina (PF UPJŠ)

**Účasť:** P. Eliaš, M. Repický

**Seminár o fuzzy logike a pravdepodobnosti na PF UPJŠ**

**Vedúci:** S. Krajči (PF UPJŠ)

**Referáty:** P. Eliaš

**Seminár z diferenciálnej a algebraickej topológie na FMFI UK**

**Vedúci:** T. Macko

**Seminár z usporiadaných algebraických štruktúr na PF UPJŠ**

**Vedúci:** D. Studenovská-Jakubíková (PF UPJŠ)

**Referáty:** E. Halušková (2x), J. Pócs (3x), V. Olejár (2x)

**Poznámka:** Seminár sa uskutočňoval aj online formou.

**Seminár z kvalitatívnej teórie diferenciálnych rovníc,**

**spoločný seminár MÚ SAV Košice a KMTI FEI TU**

**Účasť:** I. Jadlovská

**Seminár z matematickej štatistiky na FMFI UK**

**Vedúci:** A. Pázman (FMFI UK)

**Účasť:** G. Wimmer

**Panglobal Algebra and Logic Seminar (Univ. Colorado, USA)**

**Stránka:** [**http://math.colorado.edu/algebralogic/**](http://math.colorado.edu/algebralogic/)

**Vedúci:** K. A. Kearnes (Univ. Colorado, USA)

**Účasť:** E. Halušková

**Poznámka:** Konaný online.

**RCQI seminár**

**Vedúci:** M. Sedlák (FÚ SAV)

**Účasť:** A. Jenčová

**?Seminár z kryptológie na FEI STU**

**Vedúci:** O. Grošek

**Účasť:** K. Nemoga, J. R. Dora, P. Sýs

**?Seminár z kybernetickej bezpečnosti na FEI STU**

**Vedúci:** spoločný seminár FEI STU, ÚI SAV, MÚ SAV, FMFI UK

**Účasť:** K. Nemoga, J. R. Dora, P. Sýs

**2.6. Vyžiadané prednášky**

*Ak boli príspevky publikované, sú súčasťou prílohy C, kategória (AFC, AFD, AFE, AFF, AFG, AFH)*

**2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach**

 **DVUREČENSKIJ, A.**: *What are weak pseudo EMV-algebras?* (online), Boolean Algebras, Lattices, Universal Algebra, Set Theory, Topology (BLAST 2021), Las Cruces, NM, USA, 9. 6.–13. 6. 2021.

 BLUHM, A.— **JENČOVÁ, A.**— NECHITA, I.: *Incompatibility in GPTs, generalized spectrahedra, and tensor norms* (online), 18th International Conference on Quantum Physics and Logic (QPL 2021), Gdansk, Poland, 7.6.2021–11.6.2021.

 **JENČOVÁ, A.**: *Renyi relative entropies and noncommutative Lp-spaces* (online), Conference in Operator Algebras and Related Topics (Opalg2021), Istanbul, Turkey, 8. 6.–10. 6. 2021.

**2.6.2. Vyžiadané prednášky na národných vedeckých podujatiach**

**2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách**

**2.6.4. Prednášky na medzinárodných vedeckých podujatiach**

 ČECH, R.— BENEŠOVÁ, B.— **MAČUTEK, J.**: *Why does negation shorten a clause?* (online), QUALICO 2021, Tokyo, Japonsko, 9. 9.–11. 9. 2021.

 ČECH, R.— KOSEK, P.— **MAČUTEK, J.**— NOGOLOVÁ, M.: *(Ne)stabilita českého biblického překladu - diachronní stylometrická analýza*, Biblický jazyk v západoslovanských překladech – podoby a proměny, Praha, ČR, 2. 7. 2021

 ČECH, R.— **MAČUTEK**, J.— KOSEK, P.: *Czech translations of the Gospel of Matthew from the diachronic point of view – plus ça change...*, 11th International Conference on Slovak National Corpus (SLOVKO 2021), Bratislava, 13. 10.–15. 10. 2021.

 **ČUNDERLÍKOVÁ, K.**: *Conditional interval valued probability and martingale convergence theorem*, The 19th World Congress of the International Fuzzy Systems Association / The 12th Conference of the European Society for Fuzzy Logic and Technology jointly with the AGOP, IJCRS, and FQAS conferences (IFSA-EUSFLAT 2021), Bratislava, 19. 9.–24. 9. 2021.

 **DVUREČENSKIJ, A.**: *The life and work of Roman Frič*, 35th International Summer Conference on Real Functions Theory (ISCORFT 2021), Academia Pomorsk, Poland, 15. 9.–16. 9. 2021.

 GALAN, V. D.— **DILNA, N. Z.**: *The systems of computer algebra as a tool of mathematical research* (online), International online conference Modern information technology and innovation methods in teaching: experience, trends, and prospects, Ternopil, Ukraine, 8. 4. 2021.

 **HALUŠKOVÁ, E.**: *On discrete properties of real continuous (monotone) functions* (online), Arbeitstagung Allgemeine Algebra 100 (AAA 100), Krakow, Poland, 5. 2.–7. 2. 2021.

 **HAVIAR, M.**: *Dualities for prioritised default bilattices* (online), The 4th Australian Alegbra Conference (AAC04), Melbourne, Australia, 18. 1.–19. 1. 2021.

 **HAVIAR, M.**: *Dualities for prioritised default bilattices* (online), Arbeitstagung Allgemeine Algebra 100 (AAA 100), Krakow, Poland, 5. 2.–7. 2. 2021.

 **HOSPODÁR, M.**— **MLYNÁRČIK, P.**: *Operations on permutation automata* (online), The 25th International Conference on Developments in Language Theory (DLT 2021), Porto, Portugal, 16. 8.–20. 8. 2021.

 **KARABÁŠ, J.**—MÁČAJOVÁ, E.— NEDELA, R.— ŠKOVIERA, M.: *Girth, oddness, and colouring defect of snarks*, The 56th Czech-Slovak Conference on Graph Theory, Rajecké Teplice, 23. 8.–27. 8. 2021.

 **KARABÁŠ, J.**—MÁČAJOVÁ, E.— NEDELA, R.— ŠKOVIERA, M.: Perfect matching index of cubic graphs with defect 3, The 56th Czech-Slovak Conference on Graph Theory, Rajecké Teplice, 23. 8.–27. 8. 2021.

 **KARABÁŠ, J.**—MÁČAJOVÁ, E.— NEDELA, R.— ŠKOVIERA, M.: *Cubic graphs of defect 3*, The 56th Czech-Slovak Conference on Graph Theory, Rajecké Teplice, 23. 8.–27. 8. 2021.

 **KARABÁŠ, J.**— NEDELA, R.— SKYVOVÁ, M.: *Classification of finite group actions on orientable surfaces*, The 56th Czech-Slovak Conference on Graph Theory, Rajecké Teplice, 23. 8.–27. 8. 2021.

 **MACKO, T.**: *The homological part of the total surgery obstruction* (poster), Manifolds and K-theory: The Legacy of Andrew Ranicki, 21. 6.–25. 6. 2021.

 **MAČUTEK, J.**— KELIH, E.: *Free or not so free? On stress position in Russian, Slovene and Ukrainian* (online), QUALICO 2021, Tokyo, Japonsko, 9. 9.–11. 9. 2021

 **MAČUTEK, J.**— **KOŠČOVÁ, M.**: *A new approach to measuring text difficulty*, II. Summer Workshop for Statistics in Linguistics (SLSW 2021), Trojanovice, ČR, 9. 8.–13. 8. 2021

 **NOVOTNÝ, B.**— KURIN, E.— NAGY, M.: *Mathematics in the evaluation of synergy of drugs*, 13th International Conference Education, Research and Development, Burgas, Bulgaria, 25. 8.–28. 8. 2021.

 PELEGRINOVÁ, K.— **MAČUTEK, J.**— ČECH, R.: *The Menzerath-Altmann law as the relation between Lengths of words and morphemes in Czech*, 11th International Conference on Slovak National Corpus (SLOVKO 2021), Bratislava, 13. 10.–15. 10. 2021.

 **WIMMER, G.**— WITKOVSKÝ, V.: *Determination of the exact confidence intervals for parameters in a model of direct measurements with independent random errors*, 13th International Conference on Measurement (MEASUREMENT 2021), Institute of Measurement Science, SAS, Bratislava,17. 5.–19. 5. 2021.

 WITKOVSKÝ, V.— **WIMMER, G.**: *Exact confidence intervals for parameters in linear models with parameter constraints*, 13th International Conference on Measurement (MEASUREMENT 2021), Institute of Measurement Science, SAS, Bratislava, 17. 5.–19. 5. 2021.

 **ZEMÁNKOVÁ, A.**: *Construction of commutative, associative functions via z-ordinal sum construction*, The 19th World Congress of the International Fuzzy Systems Association / The 12th Conference of the European Society for Fuzzy Logic and Technology jointly with the AGOP, IJCRS, and FQAS conferences (IFSA-EUSFLAT 2021), Bratislava, 19. 9.–24. 9. 2021.

**2.6.5. Prednášky na domácich vedeckých podujatiach**

**2.6.6. Prednášky na významných vedeckých inštitúciách**

**2.6.7. Ostatné prednášky**

 **KARABÁŠ, J.**—MÁČAJOVÁ, E.— NEDELA, R.— ŠKOVIERA, M.: *Perfect matching index of cubic graphs*, Výnimočné štruktúry v diskrétnej matematike 2, pracovné stretnutie podporené grantom APVV-19-0308, Modra, 31. 5.–3. 6. 2021.

 **MACKO, T.**: *Surgery theory in the topological category*, Surgery theory course by Wolfgang Lueck, University of Bonn, June 2021. /guest lecture/

 **MACKO, T.**: *Applications of surgery theory* , Surgery theory course by Wolfgang Lueck, University of Bonn, June 2021. /guest lecture/

 **MACKO, T.**: *Algebraic theory of surgery* , Surgery theory course by Wolfgang Lueck, University of Bonn, July 2021. /guest lecture/

 **MLYNÁRČIK, P.**: *Jazyky a stroje*, Letná škola Pytagoras 2021, Hotel Drotár, Hronec, 3. 7.–9. 7. 2021.

 **NEDELA, R.**: *Decycling of cubic graphs*, Výnimočné štruktúry v diskrétnej matematike 3, pracovné stretnutie podporené grantom APVV-19-0308, Modra, 18. 10.–21. 10. 2021.

**2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2021**

**2.7.1. Vynálezy, na ktoré bol v roku 2021 udelený patent**

**a) na Slovensku**

**b) v zahraničí**

**2.7.2. Vynálezy prihlásené v roku 2021**

**a) na Slovensku**

**b) v iných krajinách ako prioritná prihláška**

**c) PCT**

**d) EP**

**e) v iných krajinách v rámci tzv. národnej fázy po PCT, resp. po validácii EP**

**2.7.3. Úžitkové vzory na Slovensku**

**a) prihlásené v roku 2021**

**b) udelené v roku 2021**

**2.7.4. Realizované vynálezy**

**a) predané patenty resp. prihlášky vynálezov (v prípade úplnej zmeny majiteľa patentu)**

**b) predané licencie (v prípade že majiteľom ostáva organizácia SAV)**

*Finančný prínos pre organizáciu SAV v roku 2021 a súčet za predošlé roky sa neuvádzajú, ak je zverejnenie v rozpore so zmluvou súvisiacou s realizáciou patentu.*

**2.8. Účasť expertov na hodnotení národných projektov (APVV, VEGA a iných)**

Tabuľka 2i Experti hodnotiaci národné projekty

|  |  |  |
| --- | --- | --- |
| **Meno pracovníka** | **Typ programu/projektu/výzvy** | **Počet hodnotených projektov** |
| Zemánková Andrea | VEGA | 1 |

**2.9. Účasť na spracovaní hesiel do encyklopédie Beliana**

Počet autorov hesiel: 0

**2.10. Recenzovanie knižných publikácií a príspevkov vo vedeckých časopisoch**   
   
Tabuľka 2j Počet vypracovaných recenzií na vedecké monografie, vedecké štúdie a zborníky

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Meno pracovníka** | **Ved. monografie** | | **Príspevky v časopisoch** | | | **Zborníky** | |
| **Domáce** | **Zahra-  ničné** | **WoS, SCOPUS** | **Iné databázy** | **Ostatné** | **Domáce** | **Zahra-  ničné** |
| Čunderlíková Katarína | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Dilna Natália | 0 | 0 | 8 | 0 | 0 | 0 | 0 |
| Dvurečenskij Anatolij | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Eliaš Peter | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Fečkan Michal | 1 | 0 | 20 | 0 | 0 | 0 | 0 |
| Halušková Emília | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Holá Ľubica | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Hospodár Michal | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Hyčko Marek | 0 | 0 | 13 | 5 | 0 | 0 | 0 |
| Jadlovská Irena | 0 | 0 | 15 | 0 | 0 | 0 | 0 |
| Jenčová Anna | 0 | 0 | 11 | 0 | 0 | 0 | 0 |
| Jirásková Galina | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Kochol Martin | 0 | 0 | 5 | 15 | 0 | 0 | 0 |
| Novotný Branislav | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Okša Gabriel | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Plávalová Eva | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Pócs Jozef | 0 | 0 | 4 | 2 | 0 | 0 | 4 |
| Pulmannová Sylvia | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Repický Miroslav | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Vajteršic Marian | 0 | 0 | 4 | 0 | 0 | 0 | 6 |
| Wimmer Gejza | 1 | 0 | 5 | 0 | 0 | 1 | 0 |
| Zemánková Andrea | 0 | 0 | 13 | 0 | 0 | 1 | 1 |
| **Spolu** | **2** | **0** | **122** | **22** | **0** | **2** | **13** |

**2.11. Iné informácie k vedeckej činnosti.**

Ostatné dosiahnuté výsledky:

 Upravili sme vyvinutý softvér na sériový a paralelný výpočet SVD do tvaru publikovateľnej knižnice.

 Zaoberali sme sa všeobecnými podmienkami pre jednoznačnú riešiteľnosť okrajových úloh pre frakcionálne funkcionálno-diferenciálne rovnice. Perspektívnou metódou pre riešenie týchto úloh je Krasnoselského veta pre jednoznačnú riešiteľnosť v špeciálnom kónuse. Nám sa podarilo nájsť taký kónus.

 Definoval sa súčet n-rozmerných pozorovateľných na MV-efektových algebrách.

 V rámci infinitárnej variety σ-úplných Rieszovych MV-algebrách RMVσ, zaviedli sme algebraický analóg náhodnej premennej ako homomofizmus definovaný na voľnej algebre v RMVσ.

 Zaviedla sa najmenšia varieta wEMV-algebier obsahujúca všetky EMV-algebry a našiel sa Pierceov zväzok EMV-algebier.

 Definovali sa slabé pseudo EMV-algebry ako nekomutatívne zovšeobecnenie wEMV-algebier. Našla sa základná reprezentácia wPEMV-algebier bez najväčšieho prvku ako maximálny a normálny ideál wPEMV-algebry s top prvkom.

 Študovali sa rôzne variety wPEMV-algebier ako reprezentovateľné, kanselatívne, perfektné, slabo komutatívne a normálne-hodnotové.

 Študovali sme rozkladové vlastnosti pravdepodobnostných mier na súčinových priestoroch. Popísali sme heterogénne fuzzy formálne kontexty pomocou bimorfizmov v kategórii úplných polozväzov.

 Algebra je odvodená z 12-tónového rovnomerného ladenia (12-TET) v súčasnosti všeobecne používaného v matematickej akustike. Algebra obsahuje všetky matema-tické štruktúry z 12-TET (reálny vektorový priestor , lineárne usporiadanie, operátory posunu). V práci sme definovali asociatívnu, komutatívnu a distributívnu operáciu násobenia na založenú na teórii cyklického usporiadania vyplývajúceho z temperovania v kvintovom kruhu pomocou Pytagorejskej komy. V práci opisujeme niektoré tvrdenia v medzi jej rôznymi podštruktúrami. Algebra má početné matematické, hudobné, akustické, technické, psychologické aspekty. Algebra má priame použitie v stavbe klasických píšťalových organov.

 Nech sú intervaly reálnych čísel, je podmnožina a nech je funkcia z do . Skúmali sme diskrétnu štruktúru algebry ) pre periodickú funkciu a pre tzv. Bernoulliho posun ako nástroj, ktorý je možné používať pri riešení viacerých typov funkcionálnych rovníc a v teórii dynamických systémov. Získali sme úplnú charakte-rizáciu komponentov algebry v prípade, že je spojitá a rýdzo monotónna na .

 Nech je daná algebra . Ak každá algebra, ktorá vznikne konštrukciou direktnej limity z je retraktom algebry , tak sa nazýva algebrou s jednoduchými direktnými limitami. Dokázali sme, že okruhy celých, racionálnych a reálnych čísel sú algebrami s jednoduchými direktnými limitami, avšak okruh polynómov nie je. Ďalej, že aditívna grupa celých čísel nie je algebrou s jednoduchými direktnými limitami a aditívna grupa racionálnych čísel je.

 Dokázali sme, že keď je nespočítateľný Poľský priestor alebo lokálne pathwise connected perfektne normálny priestor s aspoň jedným neizolovaným bodom, tak existuje kvázispojitá Borelovsky nemerateľná funkcia z do . Tiež sme našli nové podmienky, pri ktorých pre každú kvázispojitú funkciu existuje ekvivalentná kvázispojitá Borelovsky merateľná funk­cia.

 Poskytli sme analógiu známej Kneserovej oscilačnej vety pre rôzne triedy lineárnych a pololineárnych funkcionálnych diferenciálnych rovníc druhého a tretieho rádu. Výsledné kritériá, získané pomocou novej metódy iterovaných odhadov monotónností neoscilatorických riešení, sú ostré v zmysle optimálnej (nevylepšiteľnej) príslušnej oscilačnej konštanty.

 Dokázali sme, že každý prvok v spektrálnej efektovej algebre má jediný (racionálny) spektrálny rozklad. Ak má efektová algebra dostatok stavov, spektrálne rozklady jednoznačne určujú prvky a ich komutativitu. Dokázali sme, že pre niektoré intervalové efektové algebry je spektralita ekvivalentná spektralite univerzálnej grupy.

 Dokázali sme, že aproximatívna konvertibilita kanálov sa dá charakterizovať pomocou zovšeobecnených max-entropií a pomocou pravdepodobností úspechu pri diskriminácii stavov (guessing games). Tieto výsledky platia pre širokú triedu kanálov a povolených superkanálov, ale aj v kontexte všeobecných probabilistických teórií.

 Regulárna sieťová grupa je množina celočíselných vektorov ortogonálnych s riadkami matice reprezentujúcej regulárny matroid, t. j., totálne unimodulárnej matice. Zaviedli sme kanonické formy istých ekvivalencií generovaných regulárnymi sieťovými grupami a študovali ich špeciálne bázy. Tým sme zlepšili niektoré výsledky týkajúce sa polynómov sčítajúcich prvky regulárnych sieťových grúp a získali sme nové odhady a formuly pre tieto polynómy.

 Popísali sme niektoré všeobecnosti o kohomologickej dĺžke variet a potom dáva explicitnú formulu pre -kohomologickú dĺžku Stiefelových variet , ako aj silné dolné ohraničenia pre -kohomologickú dĺžku projektívnych Stiefelových variet , pre všetky . Daná je aj jednoduchá formula dávajúca vzťah medzi týmito dvoma prípadmi. Takisto sa ukázali dôsledky pre Lyusternikovu-Shnirel'manovu kategóriu, ako aj systém zaujímavých číselno-teoretických identít, ktoré vyplývajú z výpočtov pre .

 Monounárne algebry sú najjednoduchšie typy algebier. Môžu byť reprezentované orientovanými grafmi s vrcholmi z ktorých vychádza práve jedna šípka. Taká reprezentácia umožňuje použiť programy na vizualizácii a riešenie niektorých vedeckých problémov. V článku sme ponúkli pohľad na vlastnosti funkcie sínus použitím monounárnych algebier.

 Skúmali sme úplnú metrizovateľnosť minimálnych usco a cusco zobrazení. Skúmali sme vyhodnocovanie synergie pre zdanlivo neohraničené dáta z odozvy.

 Dokázali sme, že váhová sum-of-digits postupnosť, s nerastúcimi váhami, ktorých suma je je rovnomerne rozdelená vtedy a len vtedy, keď je -adic van der Corputova.

 Opublikovali sme učebnicu: PALENČÁR, R.— WIMMER, G.— PALENČÁR, J.— WITKOVSKÝ, V.: *Navrhovanie a vyhodnocovanie meraní*, Bratislava : Slovenská technická univerzita v Bratislave, 2021. 160 s. ISBN 978-80-227-5080-6.  
  
Sú tu definované modely merania a postupy vyhodnotenia výsledku merania opísaného týmito modelmi. Výsledok merania môže byť vo forme hustoty rozdelenia pravdepodobnosti (PDF) odhadu meranej veličiny, číselného odhadu hodnoty a neistoty (štandardnej) a typu PDF, alebo vo forme intervalu pokrytia hodnoty meranej veličiny. Prakticky sa najčastejšie ako výsledok merania používa interval pokrytia hodnoty meranej veličiny s určitou pravdepodobnosťou. V učebnici sú uvedené postupy stanovenia výsledku merania od najjednoduchších modelov opakovaného priameho merania jednej veličiny až po modely nepriameho merania s nadbytočnosťou (počet rovníc modelu je väčší ako počet veličín, ktorých hodnoty meraním stanovujeme). Postupy vyhodnotenia sú založené na využití štatistických metód. Veľký priestor je v knihe venovaný modelom kalibrácie a vyhodnoteniam kalibrácie meradiel.

 Skúmali sme príklad s reálnymi údajmi, ktorý analyzuje priame merania tlaku elektronickými snímačmi tlaku, a ilustruje našu novú metódu na získanie presných intervalov spoľahlivosti pre neznáme parametre v modeloch lineárnej regresie. Metóda predpokladá, že chyby sú vyjadrené ako lineárne kombinácie nezávislých náhodných premenných so známymi, ale nie nevyhnutne normálnymi distribúciami. Navrhovaná metóda na výpočet intervalov spoľahlivosti v modeloch lineárnej regresie s možnými obmedzeniami parametrov je založená na aplikácii charakteristického funkčného prístupu (CFA).

 Študovali sa presné rozdelenie najlepšieho lineárneho nevychýleného odhadu (BLUE) a lineárnej kombinácie neznámych parametrov modelu v lineárnych modeloch s možnými parametrami obmedzenia. Uvádzame metódu na výpočet presných intervalov spoľahlivosti pre uvažované lineárne kombinácie parametrov modelu za predpokladu, že chyby sú lineárne kombinácie nezávislých náhodných premenných so známymi rozdeleniami pravdepodobnosti. Toto je typická situácia v meraní a metrológii. Často je potrebné zvážiť systematickosť chyby alebo neistoty určenej hodnotením typu B (t. j. na základe odborných znalostí). Navrhovaná metóda na výpočet intervalov spoľahlivosti využíva charakteristickú funkciu.

 Študovali sme ordinálne súčty, ktoré sú často používaným nástrojom v teórii agregácie ako pre konštrukciu agregačných funkcií tak aj na ich reprezentáciu. Okrem zosumarizovania klasických a najnovších výsledkov založených na ordinálnych súčtoch sme ukázali aj nové výsledky, ktoré zahŕňajú jednoznačnosť určenia t-noriem a t-konoriem pomocou ich Archimedovských komponent, popis kardinality príslušných indexových množín ako aj nekonečné ordinálne súčty agregačných funkcií, ktoré v jednej forme pokrývajú ordinálne súčty t-noriem aj t-konoriem.

 Ukázali sme nutné a postačujúce podmienky na to, aby sa uninorma dala vyjadriť ako ordinálny súčet pologrúp definovaných na neprázdnych podintervaloch jednotkového intervalu. Ukázali sme tiež, že každá uninorma lokálne internálna na sa dá rozložiť na ordinálny súčet takýchto pologrúp.

 Preštudovali sme vlastnosti z-ordinálneho súčtu a ukázali sme, že sa vždy dá previesť do základnej redukovanej formy, t.j., takej, kde každá pologroupa, ktorá patrí do vetviacej množiny je triviálna a žiadne dve pologrupy nemajú rovnaké nosiče. Tiež sme popísali kardinalitu minimálnej vetviacej množiny, ktorá zodpovedá monotónnej (a nemonotónnej) funkcii definovanej na jednotkovom intervale, ktorá je skonštruovaná pomocou z-ordinálneho súčtu.

**3. Doktorandské štúdium, iná pedagogická činnosť a budovanie ľudských zdrojov pre vedu a techniku**

**3.1. Údaje o doktorandskom štúdiu**

Tabuľka 3a Počet doktorandov v roku 2021

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Forma** | **Počet k 31.12.2021** | | | | **Počet doktorandov po doktorandskej skúške** | | **Počet ukončených doktorantúr v r. 2021** | | | | | |
| **Ukončenie z dôvodov** | | | | | |
|  | celkový počet | | z toho novoprijatí | | ukončenie úspešnou obhajobou | | predčasné ukončenie | | neúspešné ukončenie | |
| M | Ž | M | Ž | M | Ž | M | Ž | M | Ž | M | Ž |
| **Denná zo zdrojov SAV** | 4 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Denná z iných zdrojov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Externá** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Spolu** | 4 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Z toho zahraničných** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Súhrn** | 4 | | 1 | | 1 | | 0 | | 0 | | 0 | |

*Uvádzajte len doktorandov organizácie ako externej vzdelávacej inštitúcie.   
Riadok „Spolu“ je súčtom troch riadkov nad ním. Každá bunka v riadku „Súhrn“ vyjadruje celkový počet doktorandov (mužov a žien spolu), čiže je súčtom príslušných dvoch buniek z riadku „Spolu“. V stĺpci „Počet doktorandov po doktorandskej skúške“ sa uvádza počet doktorandov, ktorí počas roku 2021 boli aspoň 1 deň doktorandami po doktorandskej skúške. Sú číselne zahrnutí aj v predchádzajúcich stĺpcoch.   
Pod predčasným ukončením rozumieme ukončenie bez obhajoby dizertačnej práce pričom doktorand neabsolvoval celú štandardnú dĺžku štúdia. Pod neúspešným ukončením rozumieme ukončenie bez úspešnej obhajoby dizertačnej práce, pričom študent absolvoval celú štandardnú dĺžku štúdia.*

**3.2. Zmena formy doktorandského štúdia**

Tabuľka 3b Počty preradení z dennej formy na externú a z externej na dennú

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pôvodná forma** | **Denná z prostriedkov SAV** | **Denná z prostriedkov SAV** | **Denná z iných zdrojov** | **Denná z iných zdrojov** | **Externá** | **Externá** |
| **Nová forma** | **Denná z iných zdrojov** | **Externá** | **Denná z prostriedkov SAV** | **Externá** | **Denná z prostriedkov SAV** | **Denná z iných zdrojov** |
| **Počet** | 0 | 0 | 0 | 0 | 0 | 0 |

**3.3. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou**

Tabuľka 3c Menný zoznam ukončených doktorandov v roku 2021 úspešnou obhajobou

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Meno doktoranda** | **Forma DŠ** | **Mesiac, rok nástupu na DŠ** | **Mesiac, rok obhajoby** | **Číslo a názov študijného odboru** | **Meno a organizácia školiteľa** | **Fakulta udeľujúca vedeckú hodnosť** |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** |

**3.4. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou v nadštandardnej dĺžke štúdia**

Tabuľka 3d Menný zoznam ukončených doktorandov v roku 2021 úspešnou obhajobou v nadštandardnej dĺžke štúdia

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Meno doktoranda** | **Forma DŠ** | **Mesiac, rok nástupu na DŠ** | **Mesiac, rok obhajoby** | **Číslo a názov študijného odboru** | **Meno a organizácia školiteľa** | **Fakulta udeľujúca vedeckú hodnosť** |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** |

**3.5. Uplatnenie absolventov doktorandského štúdia**   
   
Tabuľka 3e Prehľad uplatnenia absolventov doktorandského štúdia

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Počet absolventov PhD. štúdia v roku 2021 (obhajoba leto 2021)** | **z toho koľkí sa zamestnali vo výskume (SAV, univerzity, rezortné výskumné ústavy)** | **z toho koľkí sa zamestnali v praxi mimo výskum, kde využívajú svoju kvalifikáciu** | **z toho koľkí sa zamestnali v praxi, kde nevyužívajú svoju kvalifikáciu** | **z toho koľkí boli nejaký čas nezamestnaní** |
| 0 | 0 | 0 | 0 | 0 |

*Zoznam interných a externých doktorandov je uvedený v prílohe A.*

**3.6. Medzinárodné doktorandské štúdium**

Tabuľka 3f Počet študentov v medzinárodných programoch doktorandského štúdia

|  |  |  |  |
| --- | --- | --- | --- |
| **Cotutelle** | **Co-direction** | **Iné** | **Zahraniční doktorandi  štátne občianstvo/počet** |
| 0 | 0 | 0 | 0 |

*Zahraniční doktorandi sú doktorandi v dennej alebo externej forme štúdia, ktorí sú občanmi iných krajín.   
Doktorandi školení v rámci Cotutelle alebo Co-direction sa do posledného stĺpca nezapočítavajú.*

**3.7. Zoznam študijných odborov, na ktoré má ústav uzatvorenú rámcovú dohodu, s uvedením VŠ**

Tabuľka 3g Zoznam študijných odborov, na ktoré má ústav uzatvorenú rámcovú dohodu, s uvedením univerzity/vysokej školy a fakulty, kde sa doktorandský študijný program uskutočňuje

|  |  |  |  |
| --- | --- | --- | --- |
| **Názov študijného odboru (ŠO)** | **Číslo ŠO** | **Názov doktorandského študijného programu** | **Doktorandské štúdium uskutočňované na**   (univerzita/vysoká škola a fakulta) |
| aplikovaná matematika | 9.1.9 |  | Fakulta matematiky, fyziky a informatiky UK |

*Názov a číslo študijného odboru vyplňte/vyberte podľa aktuálne platného zoznamu študijných odborov* [*https://www.portalvs.sk/sk/studijne-odbory?from=menu1*](https://www.portalvs.sk/sk/studijne-odbory?from=menu1)*.   
Do 31. 8. 2023 študujú študenti doktorandského štúdia zaradení do študijných programov podľa zoznamu MŠVVaŠ, platného do 1. 9. 2019. Pre týchto študentov je potrebné napísať názov programu ako voľný text do stĺpca 3.*

Tabuľka 3h Účasť na pedagogickom procese

|  |  |  |
| --- | --- | --- |
| **Menný prehľad pracovníkov,   ktorí boli menovaní   do odborových   komisií pre doktorandské   štúdium** | **Menný prehľad pracovníkov,   ktorí pôsobili ako členovia   vedeckých rád univerzít,   správnych rád univerzít a fakúlt** | **Menný prehľad pracovníkov,   ktorí získali vyššiu vedeckú,   pedagogickú hodnosť   alebo vyšší kvalifikačný stupeň** |
| prof. RNDr. Anatolij Dvurečenskij, DrSc. (pravdepodobnosť a matematická štatistika) | prof. RNDr. Anatolij Dvurečenskij, DrSc. (Fakulta matematiky, fyziky a informatiky UK) |  |
| prof. RNDr. Anatolij Dvurečenskij, DrSc. (aplikovaná matematika) | RNDr. Stanislav Jakubec, DrSc. (Přírodovědecká fakulta, Univerzita Hradec Králové, ČR) |  |
| prof. RNDr. Michal Fečkan, DrSc. (matematická analýza) | Mgr. Anna Jenčová, DrSc. (Univerzita Palackého, Olomouc, Česká republika ) |  |
| prof. RNDr. Michal Fečkan, DrSc. (numerická analýza a vedecko-technické výpočty) | prof. RNDr. Július Korbaš, CSc. (Fakulta matematiky, fyziky a informatiky UK) |  |
| prof. RNDr. Michal Fečkan, DrSc. (aplikovaná matematika) | doc. RNDr. Karol Nemoga, CSc. (Fakulta prírodných vied UMB) |  |
| doc. RNDr. Roman Frič, DrSc. (pravdepodobnosť a matematická štatistika) | doc. RNDr. Karol Nemoga, CSc. (Přírodovědecká fakulta, Univerzita Hradec Králove, ČR) |  |
| doc. RNDr. Roman Frič, DrSc. (geometria a topológia) |  |  |
| doc. RNDr. Ľubica Holá, DrSc. (geometria a topológia) |  |  |
| doc. RNDr. Ľubica Holá, DrSc. (aplikovaná matematika) |  |  |
| prof. RNDr. Július Korbaš, CSc. (geometria a topológia) |  |  |
| prof. RNDr. Roman Nedela, DrSc. (aplikovaná matematika) |  |  |
| prof. RNDr. Roman Nedela, DrSc. (informatika) |  |  |

Tabuľka 3h (pokr.) Účasť na pedagogickom procese

|  |  |  |
| --- | --- | --- |
| **Menný prehľad pracovníkov,   ktorí boli menovaní   do odborových   komisií pre doktorandské   štúdium** | **Menný prehľad pracovníkov,   ktorí pôsobili ako členovia   vedeckých rád univerzít,   správnych rád univerzít a fakúlt** | **Menný prehľad pracovníkov,   ktorí získali vyššiu vedeckú,   pedagogickú hodnosť   alebo vyšší kvalifikačný stupeň** |
| doc. RNDr. Karol Nemoga, CSc. (geometria a topológia) |  |  |
| doc. RNDr. Miroslav Repický, CSc. (informatika) |  |  |
| doc. RNDr. Oto Strauch, DrSc. (aplikovaná matematika) |  |  |
| prof. RNDr. Gejza Wimmer, DrSc. (metrológia) |  |  |

**3.8. Údaje o pedagogickej činnosti**   
   
Tabuľka 3i Prednášky a cvičenia vedené v roku 2021

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PEDAGOGICKÁ ČINNOSŤ** | **Prednášky** | | **Cvičenia a semináre** | |
| **doma** | **v zahraničí** | **doma** | **v zahraničí** |
| **Počet prednášateľov alebo vedúcich cvičení** | 9 | 2 | 7 | 0 |
| **Celkový počet hodín v r. 2021** | 914 | 153 | 381 | 0 |

*Prehľad prednášateľov predmetov a vedúcich cvičení, s uvedením názvu predmetu, úväzku, katedry, fakulty, univerzity/vysokej školy je uvedený v prílohe D.*

Tabuľka 3j Aktivity pracovníkov na VŠ

|  |  |  |
| --- | --- | --- |
| **1.** | **Počet pracovníkov, ktorí pôsobili ako vedúci alebo konzultanti   diplomových a bakalárskych prác** | 8 |
|
| **2.** | **Počet vedených alebo konzultovaných diplomových a bakalárskych prác** | 11 |
|
| **3.** | **Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)** | 1 |
|
| **4.** | **Počet školených doktorandov (aj pre iné inštitúcie)** | 1 |
|
| **5.** | **Počet oponovaných dizertačných a habilitačných prác** | 6 |
|
| **6.** | **Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce** | 3 |
|
| **7.** | **Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc.   prác** | 3 |
|
| **8.** | **Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD.   prác** | 2 |
|
| **9.** | **Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti   v inauguračnom alebo habilitačnom konaní na vysokých školách** | 2 |
|

**3.9. Iné dôležité informácie k pedagogickej činnosti**

Pracovníci Matematického ústavu SAV úspešne školia doktorandov na iných školiacich pracoviskách mimo MÚ SAV.

**M. Vajteršic:** Mag. Markus Flatz (Univ. Salzburg) - 1128 Supercomputing - externý doktorand

**R. Nedela:** Mgr. Martin Zeman (MFF UK, Praha)

**4. Medzinárodná vedecká spolupráca**

**4.1. Medzinárodné vedecké podujatia**

**4.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2021 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia**   
   
Letná škola z algebry a usporiadaných množín 2021, Smižany (Hotel Čingov), 05.09.-11.09.2021

**4.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2022 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)**   
   
The 36rd International Summer Conference on Real Functions Theory (ISCORFT 2022)/36. medzinárodná letná konferencia z teórie reálnych funkcií (ISCORFT 2022), Stará Lesná, 11.09.-16.09.2022, (Ľubica Holá, 02/ 5751 0502, lubica.hola@mat.savba.sk)

The 22nd Central European Conference on Cryptography (CECC 2022) / 22. Stredoeurópska conferencia z kryptografie (CECC 2022), Smolenice, 26.06.2022-29.06.2022, (Karol Nemoga, 02/ 5751 0414, karol.nemoga@mat.savba.sk)

**4.1.3. Počet pracovníkov v programových a organizačných výboroch medzinárodných konferencií**

Tabuľka 4a Programové a organizačné výbory medzinárodných konferencií

|  |  |  |  |
| --- | --- | --- | --- |
| **Meno pracovníka** | **Programový** | **Organizačný** | **Programový i organizačný** |
| Holá Ľubica | 1 | 0 | 0 |
| Jenčová Anna | 1 | 0 | 0 |
| Nemogý Karol | 1 | 0 | 0 |
| Wimmer Gejza | 1 | 0 | 0 |
| Zemánková Andrea | 2 | 0 | 0 |
| **Spolu** | 6 | 0 | 0 |

**4.2. Členstvo a funkcie v medzinárodných orgánoch**

**4.2.1. Členstvo a funkcie v medzinárodných vedeckých spoločnostiach, úniách a národných komitétoch SR**

RNDr. Katarína Čunderlíková, PhD.

EUSFLAT - European Society for Fuzzy Logic and Technology (funkcia: člen)

IFSTART - Intuitionistic Fuzzy Sets: Theory, Applications and Related Topics (funkcia: člen)

prof. RNDr. Anatolij Dvurečenskij, DrSc.

Európska akadémia vied a umení (funkcia: člen)

International Quantum Structure Association (funkcia: člen výboru)

doc. RNDr. Roman Frič, DrSc.

International Quantum Structures Association (funkcia: člen)

Ing. Irena Jadlovská, PhD.

International Society of Difference Equations (funkcia: člen)

RNDr. Alžbeta Michalíková, PhD.

EUSFLAT - European Society for Fuzzy Logic and Technology (funkcia: člen)

IFSTART - Intuitionistic Fuzzy Sets: Theory, Applications and Related Topics (funkcia: koordinátorka pracovnej skupiny za SR)

prof. RNDr. Roman Nedela, DrSc.

Európska matematická spoločnosť (funkcia: člen)

doc. RNDr. Karol Nemoga, CSc.

ACM (Association for Computing Machinery) (funkcia: člen)

IACR International Association for Cryptology (funkcia: člen)

IEEE Institute of Electrical and Electronics Engineers (funkcia: člen)

SIAM Society for Industrial and Applied Mathematics (funkcia: člen)

doc. RNDr. Sylvia Pulmannová, DrSc.

American Mathematical Society (funkcia: člen)

doc. RNDr. Oto Strauch, DrSc.

American Mathematical Society (funkcia: člen)

prof. RNDr. Marian Vajteršic, DrSc.

European Academy of Sciences and Arts (EASA) (funkcia: člen)

Institute of Electrical and Electronics Engineers (IEEE) (funkcia: člen)

**4.3. Účasť expertov na hodnotení medzinárodných projektov (EÚ RP, ESF a iných)**

Tabuľka 4b Experti hodnotiaci medzinárodné projekty

|  |  |  |
| --- | --- | --- |
| **Meno pracovníka** | **Typ programu/projektu/výzvy** | **Počet hodnotených projektov** |
| Nedela Roman | Hodnotenie Centier excelencie pre Španielske ministerstvo vedy a inovácií, Severo Ochoa Centers / María de Maeztu Units | 23 |
| Nemoga Karol | NATO ISEG | 24 |

**4.4. Najvýznamnejšie prínosy MVTS ústavu vyplývajúce z mobility a riešenia medzinárodných projektov a iné informácie k medzinárodnej vedeckej spolupráci**

Pokračovala spolupráca na multilaterálnom projekte " *Development of next-generation eigenvalue/singular value computation library with high scalability and high accuracy*". Členovia:

 Yusaku Yamamoto, The University of Electro-Communications, Tokyo, Japan

 Marian Vajteršic, University of Salzburg, Austria and Slovak Academy of Sciences, Bratislava, Slovakia

 Gabriel Okša, Slovak Academy of Sciences, Bratislava, Slovakia

 Martin Bečka, Slovak Academy of Sciences, Bratislava, Slovakia

 Shuhei Kudo, RIKEN AICS, Kobe, Japan

 Akira Imakura, University of Tsukuba, Tsukuba, Japan

E. Plávalová spolupracovala v skupine Exoplanet Group s Astronomickým ústavom AV ČR v Ondřejove, ČR. Zoznam všetkých členov skupiny je na stránke:

<http://stelweb.asu.cas.cz/exogroup/en_members.html>.

Kvôli sprísneným protiepidemiologickým opatrenia proti šíreniu Covid 19, väčšina medzinárodných konferencií sa buď presunula na neurčitý čas alebo prešli do on-line priestoru.

Matematický ústav SAV bol spoluriešiteľom projektu ERACoSysMed (2nd Joint Transnational Call for European Projects on Systems Medicine), spoluriešiteľské organizácie sú zo Španielska, Rakúska, Slovinska, Veľkej Británie, Nórska, Belgicka, Holandska, Luxemburska, Talianska, Izraela, Francúzska a Nemecka. Spolu 13 tímov, z Belgicka dva. Vedúcim za MÚ SAV je B. Novotný (ďalší riešiteľ za MÚ SAV P. Bokes). Projekt je financovaný SAV za spoluúčasti ústavu. Trvanie projektu bolo 1. 7. 2018 – 30. 6. 2021.

*Prehľad údajov o medzinárodnej mobilite pracovníkov organizácie je uvedený v Prílohe E.*

*Prehľad a údaje o medzinárodných projektoch sú uvedené v kapitole 2 a Prílohe B.* **5. Koncepcia dlhodobého rozvoja organizácie**

**5.1. Odporúčania z posledného pravidelného hodnotenia organizácií SAV (akreditácie)**

Odporúčania Medzinárodného panelu.

* Zriadiť medzinárodný poradný panel.
* Pokračovať v doktorandskom štúdiu, ktorého zameranie musí byť atraktívne pre študentov.
* Posilniť zložku postdoktorandov na ústave.
* Pracovať ďalej na vyváženosti pomeru žien na pracovisku.
* Posilniť aktivity smerom ku účasti študentov na ústave.

SAV prijala širší akčný plán. Oba tieto dokumenty, t.j. Akčný plán SAV a odporúčania panelu boli rozpracované do Akčného plánu Matematického ústavu SAV.

**5.2. Hlavné body Akčného plánu organizácie a stav ich plnenia**

Akčný plán bol zameraný na všetky oblasti, ktoré postihoval Akčný plán SAV. Hlavné zameranie ústavu vo všetkých smeroch jeho činnosti aj v r. 2020 boli.

1. Doktorandské štúdium
2. Spolupráca s VŠ
3. Diverzita pracovníkov
4. Projektová aktivita, medzinárodné projekty
5. Medziakademická spolupráca
6. Strategické zameranie
7. Multidisciplinárny výskum
8. Strategické formovanie ústavu
9. Pomenovanie ústavu
10. Publikačné prostredie
11. Publikovanie vlastných výsledkov
12. Vydávanie časopisov
13. Problematika duševného vlastníctva
14. Rozpočet pracoviska
15. Manažment a infraštruktúra pracoviska

Akčný plán je každoročne prehodnocovaný.

**5.3. Aktualizácia Akčného plánu organizácie v roku 2021**

V roku 2021 sme urobili niekoľko výrazných krokov v jeho plnení:

* Na detašované pracovisko MÚ SAV v Košiciach nastúpila od 1. 7. 2021 mladá talentovaná kolegyňa Ing. I. Jadlovská, PhD. Pracuje v odbore matematická analýza, štúdium kvalitatívnej teórie diferenciálnych rovníc.
* S Výskumnou agentúrou pokračujeme v realizovaní dvoch zmlúv, ktoré máme v rámci projektov Operačného programu Výskum a inovácie v celkovej hodnote cca. 1,3 milióna EUR.
* Mgr. A. Zemánková, PhD. v decembri 2021 úspešne obhajila doktorskú prácu pre získanie titulu DrSc. Tento titul musí byť ešte schválený Vedeckou radou SAV.

Týmito krokmi sme plnili odporúčania akreditačného panelu smerom ku omladeniu ústavu, posilneniu počtu postdoktorando. Rozšírili sme spoluprácu o ďalšie atraktívne smery, napr. aktuálne problémy modelovania šírenia pandémie Covid 19 na Slovensku, ako nám bolo odporúčané. Súčasne sme rozšírenie spolupráce zamerali na získavanie ďalších mimorozpočtových zdrojov, čo umožní ďalšie zvýšenie počtu mladých pracovníkov. Zároveň sme do akčného plánu zaradili „Zvyšovanie kvalifikácie pracovníkov ústavu“.

Medzinárodný poradný panel Matematického ústavu SAV má nasledujúce zloženie:

* **Prof. Antonio Di Nola**, University of Salerno, Salerno, Taliansko,
* **Prof. Lajos Molnár, DSc.,** Dep. of Analysis, Bolyai Institute, University of Szeged, Szeged, Maďarsko
* **RNDr. Jiří Rákosník, CSc.,** bývalý riaditeľ Matematického ústavu AV ČR v Prahe.

**6. Spolupráca s univerzitami/vysokými školami a inými subjektmi v oblasti vedy a techniky, okrem aktivít uvedených v kap. 2, 3, 4**

**6.1. Spoločné pracoviská organizácie**

**6.1.1. Spolupráca s univerzitami/VŠ (fakultami)**

**Názov univerzity/vysokej školy a fakulty:** Fakulta elektrotechniky a informatiky STU

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2000

**Zhodnotenie:** spolupráca pre MO SR, NATO a NBÚ SR, spolupráca vo výskume a výchove mladých vedeckých pracovníkov, spoločný vedecký projekt APVV, výuka a príprava materiálov.

**Názov univerzity/vysokej školy a fakulty:** Fakulta matematiky, fyziky a informatiky UK

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 1990

**Zhodnotenie:** spoločný vedecký grant, výchova mladých vedeckých pracovníkov, členstvo v štátnicových komisiách.

**Názov univerzity/vysokej školy a fakulty:** Fakulta prírodných vied UMB

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2001

**Zhodnotenie:** členstvo vo VR, výuka, výchova mladých vedeckých pracovníkov, spoločný projekt APVV, VEGA, ESF na podporu vzdelávania v SR, príprava spoločných publikácií, vedenie diplomových prác, vedenie ŠVOČ prác.

**Názov univerzity/vysokej školy a fakulty:** Fakulta prírodných vied UMB

**Oblasť spolupráce:** vedecko-výskumná činnosť, vzdelávanie

**Sídlo spoločného pracoviska (ak je vytvorené):** Ústavu vied o Zemi SAV (Ďumbierska 1, Banská Bystrica)

**Začiatok spolupráce:** 2019

**Zhodnotenie:** V roku 2019 sme zmluvne zriadili spoločné pracovisko 1) Fakulty prírodných vied UMB, Banská Bystrica, 2) Ústavu vied o Zemi SAV, 3) Matematického ústavu SAV, 4) Ústavu informatiky SAV a 5) Centra biológie rastlín a biodiverzity SAV, Botanický ústav SAV.

**Názov univerzity/vysokej školy a fakulty:** Pedagogická fakulta KU

**Oblasť spolupráce:** výuka

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2020

**Zhodnotenie:** Výuka na Fakulte manažmentu (Poprad).

**Názov univerzity/vysokej školy a fakulty:** Prírodovedecká fakulta UPJŠ

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 1999

**Zhodnotenie:** spoločné vedecké granty, výuka, príprava spoločných publikácií, členstvo v komisiách, semináre, vedenie bakalárskych a diplomových prác, vypracovávanie oponentských posudkov pre diplomové a bakalárske práce, vedenie diplomovej práce.   
**Názov univerzity/vysokej školy a fakulty:** Stavebná fakulta STU

**Oblasť spolupráce:** numerická analýza, algoritmy

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2011

**Zhodnotenie:** pedagogická činnosť

**Názov univerzity/vysokej školy a fakulty:** Strojnícka fakulta STU

**Oblasť spolupráce:** spoločný grant

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2020

**Zhodnotenie:** Spolupráca na grante.

**Názov univerzity/vysokej školy a fakulty:** Strojnícka fakulta STU

**Oblasť spolupráce:** veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2020

**Zhodnotenie:** Spolupráca na riešení APVV projektu s Ústavom automatizácie, merania a aplikovanej informatiky.

**Názov univerzity/vysokej školy a fakulty:** Technická univerzita v Košiciach

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2002

**Zhodnotenie:** výuka, spolupráca vo vedeckých grantoch, seminár.

**Názov univerzity/vysokej školy a fakulty:** Trnavská univerzita v Trnave

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2002

**Zhodnotenie:** výuka, spolupráca vo vedeckých projektoch.

**Názov univerzity/vysokej školy a fakulty:** Univerzita Konštantína Filozofa v Nitre

**Oblasť spolupráce:** pedagogika, veda a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2002

**Zhodnotenie:** výuka, spolupráca vo vedeckých projektoch.

**Názov univerzity/vysokej školy a fakulty:** Ústav matematiky a statistiky, Přírodovědecká fakulta, Masarykova univerzita, Brno, ČR

**Oblasť spolupráce:** pedagogika a výskum

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 2002

**Zhodnotenie:** Prednášky a výchova študentov.

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

**6.1.2. Spoločné pracoviská s inými organizáciami SAV**

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

**6.2. Spoločné pracoviská organizácie s inými inštitúciami mimo SAV a VŠ**

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

**6.3. Spoločné projekty s univerzitami a ostatnými inštitúciami mimo SAV**

**Názov projektu:** Problémy ochrany informácií pre štátnu sféru SR

**Agentúra:**

**číslo projektu:**

**Spolupracujúce inštitúcie:** MO SR

**Koordinátor projektu:**

**Začiatok spolupráce:** 2013

**Zhodnotenie:** Rozpracované boli metódy ochrany informácií. Finančný prínos pre organizáciu 0 EUR.

*Pozn.: uviesť konkrétne spoločné aj bilaterálne projekty na základe platnej zmluvy o spolupráci*

**6.4. Iné typy spoločných aktivít s inštitúciami mimo SAV**

Ondrej Šuch uskutočnil charakterizáciu (merania) memristorov dodaných firmou DXC v nano-technologickom laboratóriu na vedeckom parku Žilinskej Univerzity. Tieto merania poslúžili pri príprave aplikovaného grantu IPCEI v spolupráci s technologickými firmami DXC, IMT a Elektro-technickým ústavom SAV.

**7. Aplikácia výsledkov výskumu v spoločenskej a hospodárskej praxi**

**7.1. Výsledky výskumu organizácie aplikované v spoločenskej a hospodárskej praxi**

Spolu s FEI STU sme sa zúčastňovali výskumu Problematiky ochrany informácií pre štátnu sféru SR. Výsledky boli aplikované pre potreby MO SR.

**7.2. Kontraktový – zmluvný výskum (vrátane zahraničných kontraktov)**

Názov/účel kontraktového výskumu: Vývoj, počítačová implementácia a nasadenie v praxi algoritmov na odhaľovanie únikov plynu z potrubí

Zadávateľ výskumného kontraktu: ttc, s.r.o., Nitra

Začiatok spolupráce: 2004

Ukončenie spolupráce: trvá

Finančný prínos pre organizáciu (€): 0

**7.3. Iné formy aplikácie výsledkov výskumu v spoločenskej a hospodárskej praxi**   
 **8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné organizácie**

**8.1. Členstvo v poradných zboroch vlády SR, Národnej rady SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.**

Tabuľka 8a Členstvo v poradných zboroch Národnej rady SR, vlády SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

|  |  |  |
| --- | --- | --- |
| **Meno pracovníka** | **Názov orgánu** | **Funkcia** |
| doc. RNDr. Karol Nemoga, CSc. | Zbor expertov – ISEG, NATO | člen |

**8.2. Expertízna činnosť a iné služby pre štátnu správu a samosprávy**   
   
Pozri časť 7.1.

**8.3. Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO**

Tabuľka 8b Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

|  |  |  |
| --- | --- | --- |
| **Meno pracovníka** | **Názov orgánu** | **Funkcia** |
| **-** | **-** | **-** |

**8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnymi a parlamentnými orgánmi alebo pre ich potrebu**

**9. Vedecko-organizačné a popularizačné aktivity**

**9.1.Vedecko-popularizačná činnosť**

Tabuľka 9a Súhrnné počty vedecko-popularizačných činností organizácie SAV

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Typ** | **Počet** | **Typ** | **Počet** | **Typ** | **Počet** |
| prednášky/besedy | 0 | tlač | 0 | TV | 0 |
| rozhlas | 0 | internet | 2 | exkurzie | 0 |
| publikácie | 0 | multimediálne nosiče | 1 | dokumentárne filmy | 0 |
| iné | 1 |  |  |  |  |

**9.2. Vedecko-organizačná činnosť**

Tabuľka 9b Vedecko-organizačná činnosť

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Názov podujatia** | **Domáca/ medzinárodná** | **Miesto** | **Dátum konania** | **Počet účastníkov** |
| Letná škola z algebry a usporiadaných množín 2021 | medzinárodná | Smižany (Hotel Čingov) | 05.09.-11.09.2021 | - |

**9.3. Účasť na výstavách**

**9.4. Účasť v programových a organizačných výboroch národných konferencií**   
   
Tabuľka 9c Programové a organizačné výbory národných konferencií

|  |  |  |  |
| --- | --- | --- | --- |
| **Meno pracovníka** | **Programový** | **Organizačný** | **Programový i organizačný** |
| **Spolu** |  |  |  |

**9.5. Členstvo v redakčných radách časopisov**

RNDr. Katarína Čunderlíková, PhD.

Frontiers in Network Physiology / Generalized Nets and Fuzzy Sets (funkcia: Associate Editor)

Notes on Intuitionistic Fuzzy Sets (funkcia: Editorial Board)

prof. RNDr. Anatolij Dvurečenskij, DrSc.

Acta Universitatis Palackianae Olomucensis, Facultas Rerum Naturalium, Mathematica (funkcia: člen redakčnej rady)

Indian Journal of Mathematics (funkcia: člen)

J. Algebraic Hyperstructures and Logical Algebras (funkcia: člen)

Mathematica Slovaca (funkcia: výkonný editor)

Military and Science (funkcia: člen redakčnej rady)

Obzory matematiky, fyziky a informatiky (funkcia: člen redakčnej rady )

Soft Computing (funkcia: editor)

Tatra Mountains Mathematical Publications (funkcia: člen redakčnej rady)

Transactions on Fuzzy Sets and Systems (funkcia: člen redakčnej rady)

prof. RNDr. Michal Fečkan, DrSc.

Communications in Mathematical Analysis (funkcia: editor)

Differential Equations & Applications (funkcia: editor)

Discontinuity, Nonlinearity and Complexity (funkcia: editor)

Dynamics of Partial Differential Equations (funkcia: editor)

Electronic Journal of Qualititive Theory of Differential Equations (funkcia: editor)

Journal of Applied Mathematics (funkcia: editor)

Journal of Applied Mathematics, Statistics and Informatics (JAMSI) (funkcia: editor)

Journal of Modeling, Simulation, Identification, and Control (funkcia: editor)

Mathematica Slovaca (funkcia: editor)

Mathematical Notes, Miskolc University (funkcia: editor)

doc. RNDr. Roman Frič, DrSc.

Tatra Mountains Mathematical Publications (funkcia: člen redakčnej rady)

doc. RNDr. Ján Haluška, CSc.

Myšlienky a fakty, aperiodikum slovenských prírodovedcov a technikov, ISBN 978-80-89456-07-9 (funkcia: člen redakčnej rady)

Tatra Mountains Mathematica Publications (funkcia: člen redakčnej rady)

doc. RNDr. Ľubica Holá, DrSc.

Khayyam Journal of Mathematics (funkcia: člen redakčnej rady)

Mathematica Slovaca (funkcia: člen redakčnej rady)

Tatra Mountains Mathematical Publications (funkcia: člen redakčnej rady)

prof. RNDr. Juraj Hromkovič, DrSc.

Computing and Informatics (funkcia: člen)

Grammars (funkcia: člen)

Pokroky matematiky, fysiky a astronomie (funkcia: člen)

RAIRO­ Theoretical Information and Applications (funkcia: člen)

Ing. Irena Jadlovská, PhD.

Journal of Mathematics and Computer Science (funkcia: editor)

Mathematics (funkcia: editor špeciálneho čísla s názvom Mathematical Modeling and Simulation of Oscillatory Phenomena)

RNDr. Stanislav Jakubec, DrSc.

Mathematica Slovaca (funkcia: redaktor pre algebraickú teóriu čísel)

prof. RNDr. Július Korbaš, CSc.

Mathematica Slovaca (funkcia: zodpovedný redaktor)

RNDr. Alžbeta Michalíková, PhD.

Journal Frontiers in Network Physiology (funkcia: Associate Editor for Generalized Nets and Fuzzy Sets)

Notes on Intuitionistic Fuzzy Sets (funkcia: Editorial Board member)

prof. RNDr. Roman Nedela, DrSc.

Acta Universitatis Mathiae Belii, Ser. Math. (funkcia: člen redakčnej rady)

Ars Mathematica Contemporanea (funkcia: člen redakčnej rady)

Tatra Mountains Mathematical Publications (funkcia: člen redakčnej rady)

doc. RNDr. Karol Nemoga, CSc.

Journal of Environmental Protection, Safety, Education and Management (funkcia: člen)

Tatra Mountains Mathematical Publications (funkcia: vedúci redaktor)

Zentralblatt MATH Slovak Unit (funkcia: výkonný redaktor)

Mgr. Branislav Novotný, PhD.

Tatra Mountains Mathematical Publications (funkcia: editor)

doc. PaedDr. Martin Papčo, PhD.

Obzory matematiky, fyziky a informatiky (OMFI) (funkcia: člen edičnej rady)

RNDr. Jozef Pócs, PhD.

Tatra Mountains Mathematical Publications (funkcia: editor)

doc. RNDr. Sylvia Pulmannová, DrSc.

International Journal of Theoretical Physics (funkcia: člen)

Mathematica Slovaca (funkcia: vedúci redaktor)

Tatra Mountains Mathematical Publications (funkcia: člen)

doc. RNDr. Oto Strauch, DrSc.

Uniform Distribution Theory (funkcia: výkonný redaktor)

prof. RNDr. Marian Vajteršic, DrSc.

Computing and Informatics (CAI) (funkcia: člen redakčnej rady)

International Journal of Computer Science & Information Technology Applications (IJCSITA) (funkcia: člen redakčnej rady)

Parallel Processing Letters (PPL) (funkcia: člen redakčnej rady)

Scalable Computing: Practice and Experience (SCPE) (funkcia: člen redakčnej rady)

Scientific Publications of the State University of Novi Pazar (funkcia: člen redakčnej rady)

prof. RNDr. Gejza Wimmer, DrSc.

Ekonomika a informácia (funkcia: člen )

Glottometrics (funkcia: člen redakčnej rady)

Mathematica Slovaca (funkcia: člen)

Tatra Mountains Mathematical Publications (funkcia: člen)

RNDr. Tibor Žáčik, CSc.

Tatra Mountains Mathematical Publications (funkcia: výkonný redaktor)

Zentralblatt MATH Slovak Unit (funkcia: výkonný redaktor)

**9.6. Činnosť v domácich vedeckých spoločnostiach**

Mgr. Martin Bečka, PhD.

Slovenská informatická spoločnosť (funkcia: člen)

RNDr. Katarína Čunderlíková, PhD.

JSMF - Jednota slovenských matematikov a fyzikov (funkcia: člen)

prof. RNDr. Anatolij Dvurečenskij, DrSc.

Humboldtov klub (funkcia: člen)

Jednota slovenských matematikov a fyzikov (funkcia: člen výboru JSMF BA 1)

Učená spoločnosť SAV (funkcia: člen)

doc. RNDr. Roman Frič, DrSc.

Jednota slovenských matematikov a fyzikov (funkcia: člen )

Slovenská matematická spoločnosť (funkcia: člen)

doc. RNDr. Ján Haluška, CSc.

Jednota slovenských matematikov a fyzikov (funkcia: člen)

Slovenská matematická spoločnosť (funkcia: člen)

Ing. Michal Hospodár, PhD.

Slovenská matematická spoločnosť (funkcia: člen)

RNDr. Galina Jirásková, CSc.

Jednota slovenských matematikov a fyzikov (funkcia: člen)

RNDr. Martin Kochol, PhD., DSc.

Humboldtov klub na Slovensku (funkcia: člen)

Jednota slovenských matematikov a fyzikov (funkcia: člen)

prof. RNDr. Július Korbaš, CSc.

Jednota slovenských matematikov a fyzikov (funkcia: člen Výboru pobočky Bratislava 1)

RNDr. Alžbeta Michalíková, PhD.

JSMF - Jednota slovenských matematikov a fyzikov (funkcia: člen)

Mgr. Peter Mlynárčik, PhD.

Jednota slovenských matematikov a fyzikov. (funkcia: člen)

doc. RNDr. Karol Nemoga, CSc.

Jednota slovenských matematikov a fyzikov (funkcia: člen)

SPNZ Slovenský plynárenský a naftový zväz (funkcia: člen)

Mgr. Viktor Olejár

QSlovakia (funkcia: Člen)

Mgr. Eva Plávalová, PhD.

Slovenská astronomická spoločnosť pri Slovenskej akadémii vied (funkcia: predseda sekcie terminológie)

doc. RNDr. Miroslav Repický, CSc.

Jednota slovenských matematikov a fyzikov (funkcia: člen)

prof. RNDr. Marian Vajteršic, DrSc.

Austrian Centre for Scientific Computing (ACSC) (funkcia: vedúci sekcie)

Humboldtov kluv v SR (funkcia: člen)

Jednota slovenskych matematikov a fyzikov (JSMF) (funkcia: člen)

Stiftungs- und Foerderungsgesellschaft der Paris-Lodron-Universität Salzburg (funkcia: člen)

prof. RNDr. Gejza Wimmer, DrSc.

JSMF (funkcia: člen výboru pobočky Bratislava I)

**9.7. Iné dôležité informácie o vedecko-organizačných a popularizačných aktivitách**

**10. Činnosť knižnično-informačného pracoviska**

**10.1. Knižničný fond**

Tabuľka 10a Knižničný fond

|  |  |  |
| --- | --- | --- |
| **Knižničné jednotky spolu** | | 27 122 |
| z toho | knihy a zviazané periodiká | 27 120 |
| audiovizuálne dokumenty | - |
| elektronické dokumenty (vrátane digitálnych) | - |
| mikroformy | - |
| iné špeciálne dokumenty - dizertácie, výskumné správy | 2 |
| Rukopisy, vzácne tlače | - |
| Počet titulov dochádzajúcich periodík | | 78 |
| z toho zahraničné periodiká | | 68 |
| Ročný prírastok knižničných jednotiek | | 107 |
| v tom | kúpou | 14 |
| darom | 3 |
| výmenou | 90 |
| bezodplatným prevodom | - |
| náhradou | - |
| Úbytky knižničných jednotiek | | - |
| Knižničné jednotky spracované automatizovane | | - |

*Výraz* ***„v tom“*** *označuje úplné (vyčerpávajúce) údaje, ktorých súčet sa musí rovnať údaju v riadku „spolu“, čiže nadradenému riadku.*

*Výraz* ***„z toho“*** *označuje neúplné (výberové) údaje, ktorých súčet sa nemusí rovnať údaju v riadku „spolu“.*

**10.2. Výpožičky a služby**

Tabuľka 10b Výpožičky a služby

|  |  |  |
| --- | --- | --- |
| **Výpožičky spolu (riadok 1)** | | 33 |
| v tom z r. 1 | prezenčné výpožičky | 9 |
| absenčné výpožičky | 24 |
| v tom z r. 1 | odborná literatúra pre dospelých | 28 |
| výpožičky periodík | 5 |
| MVS iným knižniciam | | - |
| MVS z iných knižníc | | - |
| MMVS iným knižniciam | | - |
| MMVS z iných knižníc | | - |
| Počet vypracovaných bibliografií | | - |
| Počet vypracovaných rešerší | | 37 |

**10.3. Používatelia**

Tabuľka 10c Používatelia

|  |  |
| --- | --- |
| Registrovaní používatelia | 35 |
| Návštevníci knižnice spolu (bez návštevníkov podujatí) | 12 |

**10.4. Iné údaje**

Tabuľka 10d Iné údaje

|  |  |
| --- | --- |
| On-line katalóg knižnice na internete ( 1=áno, 0=nie) | 0 |
| Náklady na nákup knižničného fondu v € | 2 398,80 |

**10.5. Iné informácie o knižničnej činnosti**

V roku 2021 bol zabezpečený voľný prístup do matematickej databázy Zentralblatt MATH (FIZ Karlsruhe GmbH) ako súčasť práce Slovenskej jednotky redakcie, ktorú zabezpečuje Matematický ústav SAV.

**11. Aktivity v orgánoch SAV**

**11.1. Členstvo vo Výbore Snemu SAV**

doc. RNDr. Karol Nemoga, CSc.

- člen

**11.2. Členstvo v Predsedníctve SAV a vo Vedeckej rade SAV**

**11.3. Členstvo v komisiách SAV**

prof. RNDr. Anatolij Dvurečenskij, DrSc.

- Komisia SAV pre posudzovanie vedeckej kvalifikácie zamestnancov (člen)

- Komisia SAV pre rovnosť príležitostí (člen)

- Rada SAV pre vzdelávanie a doktorandské štúdium (člen)

doc. RNDr. Karol Nemoga, CSc.

- Edičná rada SAV (Podpredseda Edičnej rady)

- Komisia SAV pre ekonomické otázky (člen)

- Komisia SAV pre medzinárodnú vedecko-technickú spoluprácu (člen)

- Komisia SAV pre spoluprácu s vedeckými spoločnosťami (člen)

- Rada riaditeľov ústavov SAV (predseda výboru 1. sekcie, podpredseda rady)

**11.4. Členstvo v orgánoch VEGA**

Mgr. Martin Bečka, PhD.

- Komisia VEGA č.5 pre elektrotechniku, automatizáciu a riadiace systémya príbuzné odbory informačných a komunikačných technológií (člen)

prof. RNDr. Michal Fečkan, DrSc.

- Komisia VEGA č. 1 pre matematické vedy, počítačové a informatické vedy a fyzikálne vedy (člen)

Mgr. Anna Jenčová, DrSc.

- Komisia VEGA č. 1 pre matematické vedy, počítačové a informatické vedy a fyzikálne vedy (člen)

doc. Ing. Gabriel Okša, CSc.

- Komisia VEGA č. 1 pre matematické vedy, počítačové a informatické vedy a fyzikálne vedy (člen)   
 **12. Hospodárenie organizácie**

**12.1. Výdavky organizácie**

Tabuľka 12a Výdavky organizácie (skutočnosť k 31. 12. 2021 v €)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Typ organizácie** (RO,PO) |  | **Zdroje, z ktorých sa kryli jednotlivé výdavky** | | | |
| **Výdavky** | **Spolu** | **kapitola SAV (111)** | **iné štátne a verejné zdroje** | **ostatné zdroje** | **% krytia z kapitoly SAV** |
| **1. Bežné výdavky** | **1 806 671,06** | **1 329 926,92** | **474 833,79** | **1 910,35** | **76,31** |
| z toho: mzdy (610) | 1 052 882,68 | 838 206,68 | 214 676,00 | - | 79,61 |
| vedecká výchova štipendiá (640) | 31 849,00 | 31 849,00 | - | - | 100,00 |
| poistné a príspevok do poisťovní (620) | 362 733,81 | 290 264,39 | 72 469,42 | - | 80,02 |
| tovary a služby (630) | 197 983,37 | 151 106,85 | 46 876,52 | - | 76,32 |
| transfery partnerom projektov (640) | 12 579,00 | - | 12 579,00 | - | 0,00 |
| **2. Kapitálové výdavky** | **149 232,85** | **21 000,00** | **128 232,85** | **0,00** | **14,07** |
| z toho: obstarávanie kapitálových aktív | 149 232,85 | 21 000,00 | 128 232,85 | - | 14,07 |
| kapitálové transfery | - | - | - | - | - |

**12.2. Zdroje financovania organizácie**

Tabuľka 12b Zdroje financovania organizácie (skutočnosť k 31. 12. 2021 v €)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Typ organizácie** (RO,PO) |  | **Z toho kategórie** | | | |
| **Zdroje** | **Spolu** | **Kapitálové zdroje** | **zdroje na mzdy (610)** | **zdroje na odvody do poisťovní (620)** | **zdroje na transfery partnerom projektov** |
| **1. kapitola SAV (111)** | **1 350 926,92** | **21 000,00** | **838 206,68** | **290 264,39** | **0,00** |
| z toho: VEGA | 62 517,00 | - | - | - | - |
| MVTS výskumné projekty | 8 333,00 | - | - | 361,40 | - |
| MVTS podpora | 2 000,00 | - | - | - | - |
| SASPRO/MOREPRO | - | - | - | - | - |
| Vydávanie časopisov | 25 222,83 | - | - | 320,35 | - |
| Vedecká výchova (štipendiá) | 31 849,00 | - | - | - | - |
| VTS | 4 960,00 | - | - | - | - |
| Program Štipendium | 9 375,00 | - | - | - | - |
| OTAS (630) | - | - | - | 4 599,65 | - |
| **2. ŠF EÚ vr. fin. zo ŠR** | **415 987,27** | **128 232,85** | **197 732,00** | **66 853,11** | **0,00** |
| **3. medzinárodné grantové projekty** | **0,00** | **0,00** | **0,00** | **0,00** | **0,00** |
| z toho: H2020 | - | - | - | - | - |
| **4. iné štátne a verejné zdroje (spolu)** | **58 846,52** | **0,00** | **16 944,00** | **5 616,31** | **12 579,00** |
| z toho: APVV | 58 846,5 | - | 16 944,00 | 5 616,31 | 12 579,00 |
| podpora z kapitoly MŠVVaŠ SR (stimuly) | - | - | - | - | - |
| **5. ostatné zdroje** | **1 910,35** | **0,00** | **0,00** | **0,00** | **0,00** |
| z toho: príjmy z prenájmu | - | - | - | - | - |
| príjmy z podnikateľskej činnosti | - | - | - | - | - |
| príjmy z expertnej činnosti a služieb | 1 910,35 | - | - | - | - |

**13. Nadácie a fondy pri organizácii SAV**   
   
 **14. Informácie o aktivitách súvisiacich s uplatňovaním princípov rodovej rovnosti**

**14.1. Stručné hodnotenie stavu uplatňovania princípov rodovej rovnosti v organizácii, súvisiace aktivity a opatrenia**

Rodová rovnosť je jednou z kľúčových hodnôt Európskej únie. Zásada rovnakého zaobchádzania je právne zakotvená vo vnútroštátnej legislatíve Slovenskej republiky. Základným právnym predpisom v tejto oblasti je Ústava Slovenskej republiky. Slovenská republika ako členská krajina EÚ je zároveň povinná prevziať právne záväzky, ako sú napríklad antidiskriminačné smernice. Zákon č. 365/2004 Z. z. o rovnakom zaobchádzaní v niektorých oblastiach a o ochrane pred diskrimináciou a o zmene a doplnení niektorých zákonov (antidiskriminačný zákon) je transpozíciou smerníc do vnútroštátnej legislatívy. Zákon za súčasť odstraňovania diskriminácie okrem jej zákazu určuje aj dôležitú povinnosť prijať také preventívne opatrenia, ktoré budú diskriminácii predchádzať. Princípy rodovej rovnosti a nediskriminácie sú zakotvené aj v ďalších národných predpisoch, napr. v Zákonníku práce a rovnako v medzinárodných dohovoroch a strategických dokumentoch.

Plán rodovej rovnosti a stratégia vo vyrovnávaní šancí bola prijatá na celoakademickej úrovni.

V Matematickom ústave SAV je primárnym hľadiskom pri prijímaní vedeckých pracovníkov, určovaní ich zaradenia ich vedecká výkonnosť. Aj keď podľa Tabuľky 1a a Tabuľky 1b prevaha mužov nad ženami v počte vedeckých pracovníkov a zodpovedajúca prevaha v kvalifikačných stupňoch.

Napriek tomu na Matematickom ústave v roku 2021 boli z 10 pracovníkov s hodnosťou DrSc. 3 pracovníčky a na sklonku roku 2021 úspešne obhájila túto hodnosť ďalšia žena. Rovnako sme do našej košickej pobočky prijali v roku 2021 ďalšiu fundovanú mladú vedeckú pracovníčku. Do určitej miery sme limitovaní aj skladbou absolventov škôl nášho zamerania, kde majú prevahu muži. Budeme vytvárať podmienky pre dobrú prácu žien s uvážením ich ďalších povinností v rodine.

Na Matematickom ústave sme otvorení každému, kto chce a môže prispieť ku rozvoju matematiky v rámci našich možností. Jediné hľadisko bola a vždy bude kvalita uchádzačky alebo uchádzača.

**14.2. Rodová skladba hlavných riešiteľov (vedúcich) projektov**

Tabuľka 14a Rodová skladba hlavných riešiteľov domácich projektov

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ŠTRUKTÚRA PROJEKTOV** | **Organizácia SAV je nositeľom projektu** | | | **Organizácia SAV je zmluvným partnerom** | | |
| **Počet** | **Hlavný riešiteľ** | | **Počet** | **Hlavný riešiteľ  za organizáciu** | |
| **Muž** | **Žena** | **Muž** | **Žena** |
| **1. Projekty VEGA** | 11 | 8 | 3 | 3 | 2 | 1 |
| **2. Projekty APVV** | 3 | 2 | 1 | 4 | 4 | 0 |
| **5. Iné projekty (FM EHP,   Vedecko-technické projekty,   na objednávku rezortov a pod.)** | 1 | 0 | 1 | 0 | 0 | 0 |

Tabuľka 14b Rodová skladba hlavných riešiteľov medzinárodných projektov

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ŠTRUKTÚRA PROJEKTOV** | **Organizácia SAV je nositeľom projektu** | | | **Organizácia SAV je zmluvným partnerom** | | |
| **Počet** | **Hlavný riešiteľ** | | **Počet** | **Hlavný riešiteľ  za organizáciu** | |
| **Muž** | **Žena** | **Muž** | **Žena** |
| **2. Projekty ERA.NET, ESA, JRP** | 0 | 0 | 0 | 1 | 1 | 0 |
| **5. Projekty v rámci medzivládnych   dohôd** | 1 | 1 | 0 | 0 | 0 | 0 |
| **6. Bilaterálne projekty MAD,   Mobility, Open Mobility** | 2 | 0 | 2 | 0 | 0 | 0 |

**14.3. Výskum zameraný na rodovú problematiku**

*Uveďte stručné, základné informácie o projektoch orientovaných na rodovú problematiku, ak organizácia takýto výskum realizuje. Informácie o financovaní a výsledkoch takýchto projektov sa nachádzajú v kapitole 2 a v prílohe C.*

**15. Iné významné činnosti organizácie SAV**

Od. 1.7.2011 sa spojili komisie pre obhajobu doktorských dizertačných prác, takže dnes existujú už len tri stále matematické komisie pre obhajobu DrSc. V r. 2017 bol vymenovaný prof. RNDr. A. Dvurečenskij, DrSc. za predsedu ad hoc komisie pre obhajoby doktorských dizertačných prác v  odbore vedy a techniky 010108 Pravdepodobnosť a matematická štatistika. V roku 2021 prebehla úspešná obhajoba on-line formou v tejto komisii našej kolegyne Mgr. A. Zemánkovej, PhD. ešte čaká na schválenie vo Vedeckej rade SAV.

Matematický ústav SAV sa venuje aktívne aj publikovaniu vedeckých matematických časopisov. Najväčšiu tradíciu má Mathematica Slovaca, časopis vydávaný už od roku 1951, je to medzinárodný (medzinárodná redakčná rada má 39 členov, z toho 18 zahraničných) a recenzovaný (karentovaný AMS) časopis, indexovaný v databáze SCI a SCOPUS. V roku 2008 prevzalo distribúciu časopisu vydavateľstvo Springer-Verlag (2007–2014) v spolupráci so spoločnosťou Versita, od roku 2015 spoločnosť De Gruyter, ktorá prevzala/zakúpila spoločnosť Versita. Po obsahovej stránke tento časopis uverejňuje práce zo všetkých oblastí základného matematického výskumu.

V r. 2007 začal byť časopis Mathematica Slovaca indexovaný v databáze SCI (Expanded), pričom do tejto databázy boli spätne pridané aj vydania od č. 1 za rok 2007. Podobne začal byť od roku 2008 tento časopis indexovaný v databáze SCOPUS. Časopis prešiel od 600 strán formátu B5 a 48 článkov (2007) ku dnešným 1500 stranám formátu A4 s asi 130 článkami.

Vyše 75 % prác je zamietnutých (z viac ako 550 zaslaných). V r. 2010 Mathematica Slovaca získala IF= 0,308 a v r. 2011 sa IF zvýšil na 0,316. Súčasný impakt faktor je IF(2020)=0,770, päťročný impakt faktor 0,545 a je v 3. kvartile v sekcii matematika. V databáze Scopus má časopis SJR=0,445 (Scimago Journal Ranking) a je v 3. kvartile.

Aj keď distribúcia časopisu prostredníctvom vydavateľstva Springer-Verlag spôsobila redukciu výmeny časopisu (vydavateľstvo Springer-Verlag bol výhradný distribútor v období 2008-2014), dosiahli sme významne väčšie rozšírenie časopisu medzi čitateľov. Rovnako, pre našich pracovníkov je najvýznamnejší prístup ku informáciám v elektronickej forme. Od roku 2000 má časopis svoju vlastnú internetovú stránku, kde sú všetky informácie, abstrakty článkov od roku 1993. Adresa je http://maslo.mat.savba.sk. Adresa časopisu na stránkach spoločnosti Springer je

<http://www.springer.com/journal/12175>

alebo

<http://www.springerlink.com/content/1337-2211>.

Adresa časopisu na stránkach spoločnosti Versita bola

<http://www.versita.com/science/mathematics/maslo>.

Od roku 2016 je distribútorom časopisu vydavateľstvo De Gruyter a adresa časopisu je

<http://www.degruyter.com/view/j/ms>,

odkiaľ je prístup aj na predchádzajúce čísla (2007-2015). Elektronický prístup k starším ročníkom 1 (1957) - 57 (2007) je na českej elektronickej knižnici:

<http://dml.cz/handle/10338.dmlcz/134237>.

Ďalší časopis vydávaný ústavom Tatra Mountains Mathematical Publications vznikol v r. 1992 a vydávame ho v spolupráci s niektorými vysokými školami. Publikujú sa v ňom pôvodné vedecké práce zo všetkých oblastí matematického výskumu, ale vo forme monotematických čísel.

Časopis má medzinárodnú redakčnú radu (35 členov, z toho 10 zahraničných). Aj tento časopis je recenzovaný a karentovaný. V r. 2021 vyšiel 80. zväzok. Od zväzku 15 sú niektoré zväzky časopisu zaradené do Current Contents - Index to Scientific Book Contents CC / Physical, Chemical and Earth Sciences. Od roku 2000 má časopis svoju vlastnú internetovú stránku, kde sú všetky informácie, abstrakty článkov od roku 1992. Od vol. 41 v r. 2008 je indexovaný v databáze WOS (Web of Science) a CPCI (Conference Proceedings Citation Index). Od r. 2011 je tento časopis indexovaný aj v databáze Scopus. Jeho SJR (Scimago Journal Ranking) má hodnotu 0,214 a je v 3. kvartile.

Ústav získava (predajom, resp. výmenou za tento časopis) časť svojich informačných zdrojov. Adresa je [http://tatra.mat.savba.sk](http://tatra.mat.savba.sk/). Časopis je od roku 2009 distribuovaný ako Open Access aj spoločnosťou De Gruyter Sciendo s WEB stránkou <http://www.degruyter.com/view/j/tmmp>.

V roku 2006 začal ústav vydávať časopis Uniform Distribution Theory. V roku 2021 vyšiel 16. ročník. Adresa je http://udt.mat.savba.sk a http://www.boku.ac.at/MATH/udt. Časopis vydávame spolu s BOKU University vo Viedni. Je to vysoko špecializovaný vedný časopis, ktorý uverejňuje prevažne príspevky zahraničných autorov (95 percent). V roku 2016 sa dohodla jeho distribúciu aj cez spoločnosť De Gruyter Sciendo na adrese

<https://content.sciendo.com/view/journals/udt/udt-overview.xml>.

Ústav bol v r. 2021 sídlom slovenskej časti redakcie významného svetového referatívneho časopisu Zentralblatt MATH. Redakčne pripravuje abstrakty dohodnutých periodík ako sú Mathematica Slovaca, Tatra Mountains Mathematical Publications, Acta Mathematica Universitatis Comenianae, Uniform Distribution Theory a Computing and Informatics. Zapájame sa tak do celoeurópskej spolupráce a získava prístup do významnej databázy matematických poznatkov Zentralblatt MATH. V tomto roku sa spolupráca Zentralblatt ukončila, nakoľko Zentralblatt ukončil túto formu spolupráce.

Matematický ústav SAV sa spolu s Jednotou slovenských matematikov a fyzikov a Fakultou prírodných vied Univerzity Konštantína Filozofa v Nitre podieľa na príprave časopisu Obzory matematiky, fyziky a informatiky (ISSN: 1335-4981). Tento časopis je určený hlavne pre stredoškolských učiteľov matematiky, fyziky a informatiky.

Vydávanie (resp. spolupráca pri vydávaní) uvedených časopisov spolu s udržiavaním časopiseckej i knižnej vedeckej knižnice je popri vedeckej produkcii azda najvýznamnejšou aktivitou, ktorou ústav prispieva tak do pokladnice národnej kultúry ako aj medzinárodnej vedeckej spolupráce a vzájomného porozumenia.

**16. Vyznamenania, ocenenia a ceny udelené pracovníkom organizácie v roku 2021**

**16.1. Domáce ocenenia**

**16.1.1. Ocenenia SAV**

**Fečkan Michal**

Plaketa Jura Hronca za zásluhy v matematických vedách

*Oceňovateľ: SAV*

**Vajteršic Marian**

Významná osobnosť SAV

*Oceňovateľ: P SAV*

**16.1.2. Iné domáce ocenenia**

**16.2. Medzinárodné ocenenia** **17. Poskytovanie informácií v súlade so zákonom č. 211/2000 Z. z. o slobodnom prístupe k informáciám v znení neskorších predpisov**

**(Zákon o slobode informácií)**

**Matematický ústav SAV z pohľadu zákona č. 211/2000 Z.z.**

**o slobodnom prístupe k informáciám**

Podmienky, postup a rozsah slobodného prístupu občanov k informáciám vymedzeného v čl. 26, 45 a 34 Ústavy Slovenskej republiky a v čl. 17, 25 a 35 Listiny základných práv a slobôd ustanovuje zákon č. 211/2000 Z. z. o slobodnom prístupe k informáciám spolu s jeho novelizáciami platnými od 2. januára 2006 v podobe zákona č. 628/2005 Z. z., ktorým sa mení a dopĺňa zákon č. 211/2000 Z. z. o slobodnom prístupe k informáciám v znení zákona č. 747/2004 Z. z. a o zmene niektorých zákonov. V tomto zákone je uvedený rozsah povinností tzv. povinnej osoby (§ 2 citovaného zákona) pri informovaní žiadateľov o informácie (§ 4 citovaného zákona), ale i postup pri poskytovaní informácií podľa tohto zákona.

V zmysle zákona č. 211/2000 Z. z. je Matematický ústav SAV povinný zverejňovať informácie uvedené v § 3 ods. 2 a § 5 ods. 1 citovaného zákona (povinné zverejňovanie informácií) a ďalšie informácie na žiadosť.

V zmysle citovaného zákona uverejňuje Matematický ústav SAV tieto informácie:

**Spôsob zriadenia povinnej osoby, jej právomoci a kompetencie a popis organizačnej štruktúry**

Matematický ústav SAV (ďalej len MÚ SAV) je právnickou osobou zriadenou na základe zákona č. 74/1963 Zb. o Slovenskej akadémii vied v znení

 zákona č. 43/1970 Zb.,

 zákona č. 92/1977 Zb.,

 zákona č. 7/1990 Zb.,

 zákona č. 291/1992 Zb.,

 zákona č. 11/1993 Z.z.,

 zákona č. 75/1995 Z.z.

|  |  |
| --- | --- |
| **Názov organizácie:** | Matematický ústav SAV |
| **Sídlo MÚ SAV:** | Bratislava, Štefánikova 49, 814 73 Bratislava |
| **Identifikačné číslo:** | 166791 |
| **Forma hospodárenia:** | rozpočtová organizácia |
| **Dátum zriadenia:** | 01.03.1959 |
| **Označenie štatutárneho orgánu:** | Riaditeľ |

MÚ SAV je vedecká inštitúcia SR prispievajúca k rozvoju základného výskumu v matematike (najmä logika a teória množín, teória čísel, algebraické a topologické štruktúry, kvantové štruktúry diskrétna matematika, reálna a funkcionálna analýza, dynamické systémy, pravdepodobnosť a matematická štatistika). V informatike sa zameriava na rozvoj teórie algoritmov a výpočtovej zložitosti a na teoretické aspekty formálnych jazykov, automatov a výpočtových systémov. Podieľa sa na pedagogickom procese na vysokých školách. Ústav uskutočňuje doktorandské štúdium v zmysle platných právnych predpisov. Participuje na medzinárodnej vedecko-technickej spolupráci, spolupracuje vo výskume a vzdelávaní s vysokými školami a rezortnými výskumnými a vzdelávacími inštitúciami a právnickými osobami z oblasti výroby a služieb.

Ústav poskytuje poradenské a ďalšie expertízne služby, súvisiace s hlavnou činnosťou organizácie.

Ústav zabezpečuje publikáciu súvisiacu s vedecko–výskumnou činnosťou prostredníctvom periodickej a neperiodickej tlače. Vydávanie periodickej tlače sa riadi usmerneniami Predsedníctva SAV.

**Organizačná štruktúra MÚ SAV:**

 Matematický ústav SAV, Štefánikova 49, 814 73 Bratislava

 Oddelenie informatiky MÚ SAV, Dúbravská cesta 9, 841 04 Bratislava

 Detašované pracovisko MÚ SAV, Grešákova 6, 040 01 Košice

 Inštitút matematiky a informatiky MÚ SAV, Ďumbierska 1, 974 11 Banská Bystrica

**Orgány MÚ SAV:**

 Vedecká rada MÚ SAV,

 Rada riaditeľa MÚ SAV.

Činnosť ústavu sa riadi Organizačným poriadkom MÚ SAV a Pracovným poriadkom MÚ SAV.

**Financovanie MÚ SAV:**

MÚ SAV je financovaný z rozpočtovej kapitoly štátneho rozpočtu, ktorej správcom je SAV. Práva a povinnosti MÚ SAV pri správe a nakladaní s majetkom štátu sú stanovené zákonom č. 278/1993 Z.z. o správe majetku štátu v znení neskorších predpisov. MÚ SAV hospodári s rozpočtovými prostriedkami a s prostriedkami prijatými od iných subjektov v zmysle zákona č. 303/1995 Z.z. v znení neskorších predpisov.

Ďalšími zdrojmi financovania pracoviska sú

 prostriedky štátneho rozpočtu získané na základe účasti vo verejnej súťaži vypísanej na účelové financovanie úloh výskumu a vývoja

 príjmy z vlastnej činnosti

 prostriedky z medzinárodných programov výskumu a vývoja

**Organizačná štruktúra ústavu**: na internetovej stránke [www.mat.savba.sk/struktura.php](https://www.mat.savba.sk/struktura.php).

**MÚ SAV je povinné zverejňovať aj**

 označenie nehnuteľnej veci a hnuteľnej veci vo vlastníctve štátu, ktorej nadobúdacia cena bola vyššia ako 20-násobok minimálnej mzdy (§2 ods. 1 písm. b) zákona č. 90/1996 Z. z. o minimálnej mzde), ktorú MÚ SAV previedol do vlastníctva, alebo ktorá prešla do vlastníctva inej osoby než orgánu verejnej moci

 dátum prevodu alebo prechodu vlastníctva a právny titul

 informácie o osobných údajoch a iných identifikačných údajoch osôb, ktoré nadobudli tento majetok do vlastníctva, a to v rozsahu: a) meno a priezvisko, názov alebo obchodné meno; b) adresa pobytu alebo sídlo; c) identifikačné číslo, ak ide o právnickú osobu alebo fyzickú osobu –podnikateľa.

Za nadobúdaciu cenu na účely zverejnenia sa považujú, ak ide o vlastné zhotovenie, náklady na zhotovenie, a ak ide o bezodplatné nadobudnutie, cena obvyklá za obdobnú vec v mieste a čase nadobudnutia.

Uvedené informácie sa zverejňujú najmenej po dobu jedného roka odo dňa, keď došlo k prevodu alebo prechodu vlastníctva.

Tým nie je dotknutá povinnosť sprístupniť túto informáciu aj po uplynutí tejto doby.

**Miesto, čas a spôsob akým možno získať informácie; informácie o tom, kde možno podať žiadosť, návrh, podnet, sťažnosť alebo iné podanie:**

(1) Povinne zverejňované informácie možno získať na internetovej stránke [www.mat.savba.sk](https://www.mat.savba.sk/) ([www.sav.sk](https://www.sav.sk)), na informačnej tabuli MÚ SAV (Štefánikova 49, Bratislava)

(2) Nezverejnenú informáciu ústav sprístupní na základe žiadosti o sprístupnenie informácie (ďalej len „žiadosť”). Žiadosť môže žiadateľ podať písomne, ústne, faxom, elektronickou poštou alebo iným technicky vykonateľným spôsobom. Zo žiadosti musí byt zjavné, kto ju podáva, ktorých informácií sa týka a aký spôsob sprístupnenia informácie žiadateľ navrhuje.

(3) Informácia môže byť sprístupnená

a. ústne,

b. nahliadnutím do spisu s možnosťou vyhotoviť si odpis alebo výpis v sídle ústavu,

c. odkopírovaním informácií na technický nosič dát,

d. sprístupnením kópií predlôh s požadovanými informáciami,

e. telefonicky,

f. faxom,

g. poštou,

h. e-mailom,

i. odkazom na už zverejnenú informáciu.

Informácia sa sprístupňuje formou určenou žiadateľom a až keď nie je možné ju sprístupniť touto formou, po dohode so žiadateľom nasledujú iné možnosti. Prihliada sa pritom na charakter informácie, spôsob podania žiadosti a tiež na technické možnosti ústavu.

(4) Na základe žiadosti musí ústav sprístupniť všetky informácie, ktoré má k dispozícii, predovšetkým informácie týkajúce sa hospodárenia s verejnými prostriedkami a nakladania s majetkom štátu, pričom ústav musí prijať, zaevidovať a vybaviť každú žiadosť, návrh alebo iné podanie.

(5) Ústav žiadosť vybaví najneskôr do osem pracovných dní od jej podania, v odôvodnených prípadoch sa táto lehota predlžuje o ďalších 8 pracovných dní. Ak nie je možné dodržať osemdňovú lehotu, ústav to bezodkladne, najneskôr pred uplynutím osemdňovej lehoty oznámi žiadateľovi písomne s uvedením dôvodov, ktoré viedli k predĺženiu lehoty.

(6) Závažnými dôvodmi predĺženia lehoty, najviac o osem pracovných dní sú:

 vyhľadávanie a zber väčšieho počtu oddelených alebo odlišných informácií poža-dovaných na sprístupnenie v jednej žiadosti,

 vyhľadávanie a zber väčšieho počtu oddelených alebo odlišných informácií poža-dovaných na sprístupnenie žiadosti,

 preukázateľné technické problémy spojené s vyhľadávaním a sprístupňovaním infor-mácie, o ktorých možno predpokladať, že ich možno odstrániť v rámci predĺženej le-hoty.

(7) Žiadosť o sprístupnenie informácie možno podať :

 ústne alebo písomne na adresu:

Matematický ústav SAV Štefánikova 49, 814 73 Bratislava

 telefonicky na telefónnom čísle : 02 / 5751 0414

 faxom na faxové spojenie : 02 / 5249 7316

 e-mailom na adresu : [mathinst@mat.savba.sk](mailto:mathinst@mat.savba.sk)

**Postup ústavu pri vybavovaní žiadostí, návrhov, a iných podaní, vrátane lehôt, ktoré je nutné dodržať**

(1) Za včasné a pravdivé poskytnutie informácií a vybavovanie žiadostí je zodpovedný Matematický ústav SAV.

(2) Evidenciu všetkých podaných žiadostí vedie Matematický ústav SAV.

(3) Evidencia obsahuje predovšetkým :

* dátum podania žiadosti,
* obsah žiadosti, formu podania (napr. písomne, faxom, elektronickou poštou) a navrhovaný spôsob sprístupnenia informácie,
* výsledok, formu a dátum vybavenia žiadosti (napr. poskytnutie informácie kompletnej alebo čiastočnej, forma poskytnutia informácie, výzva na doplnenie, rozhodnutie o neposkytnutí, neposkytnutie bez vydania rozhodnutia, odloženie veci, postúpenie inému orgánu),
* opravný prostriedok (dátum podania a výsledok vybavenia).

(4) Žiadosť je podaná dňom, keď došla ústavu.

(5) Na žiadosť žiadateľa ak ústav písomne potvrdí podanie žiadosti a oznámi predpokladanú výšku úhrady za sprístupnenie informácie.

(6) Ak predmetom žiadosti je získanie informácií, ktoré už boli zverejnené, MÚ SAV, môže bez zbytočného odkladu, najneskôr však do piatich dní od podania žiadosti, namiesto sprístupnenia informácií žiadateľovi oznámiť údaje, ktoré umožňujú vyhľadanie a získanie zverejnenej informácie.

(7) Ak žiadosť nemá predpísané náležitosti, ústav bezodkladne vyzve žiadateľa, aby v určenej lehote, ktorá nesmie byť kratšia ako sedem dní, neúplnú žiadosť doplnil. Poučí žiadateľa aj o tom, ako treba doplnenie urobiť. Ak napriek výzve ústavu žiadateľ žiadosť nedoplní a informáciu nemožno pre tento nedostatok sprístupniť, ústav žiadosť odloží bez vydania rozhodnutia, o čom vo výzve na doplnenie upozorní žiadateľa.

(8) Ak ústav nedisponuje požadovanými informáciami, žiadosť postúpi do piatich dní od jej podania príslušnej povinnej osobe, ak je jej známa. Lehota na vybavenie žiadosti začína plynúť znovu dňom, keď povinná osoba dostala postúpenú žiadosť.

Ak takáto povinná osoba nie je známa, ústav vydá do ôsmych pracovných dní od podania žiadosti rozhodnutie o jej odmietnutí.

(9) Odpoveď na žiadosť zasiela žiadateľovi MÚ SAV. Odpoveď podpisuje riaditeľ MÚ SAV.

(10) Žiadosť s dokumentáciou sa po vybavení ukladá na MÚ SAV. O sprístupnení informácie sa urobí rozhodnutie zápisom v spise. Spis musí obsahovať všetky písomnosti týkajúce sa vybavovania žiadosti, vrátane informácie o spôsobe vybavenia. Všetky písomnosti založené v spise musia byť označené číslom z centrálnej evidencie.

(11) V prípade, ak sa žiadosti nevyhovie, hoci len sčasti, vydá sa v lehote ôsmych pracovných dní písomné rozhodnutie o odmietnutí poskytnúť informáciu. Rozhodnutie sa nevydá, ak žiadosť bola odložená (§14 ods. 3).

(12) Rozhodnutie o odmietnutí poskytnúť informáciu sa vydáva z dôvodu:

1. ustanoveného obmedzenia prístupu k informáciám (§ 8 až 11 zákona),
2. keď nie je známa taká povinná osoba, ktorá disponuje požadovanými informáciami   
   (§ 15 ods. 1 zákona).

(13) Rozhodnutie o odmietnutí poskytnúť informáciu sa nevydáva len v prípade, ak bola žiadosť odložená pre neodstránenie jej nedostatkov aj napriek predchádzajúcej výzve.

**Miesto, lehota a spôsob podania opravného prostriedku a možnosti súdneho preskúmania rozhodnutia:**

1. Proti rozhodnutiu ústavu o odmietnutí požadovanej informácie možno podať odvolanie v lehote 15 dní od doručenia rozhodnutia alebo márneho uplynutia lehoty na rozhodnutie o žiadosti. Odvolanie sa podáva ústavu.
2. O odvolaní proti rozhodnutiu ústavu rozhoduje riaditeľ ústavu, na základe vyjadrenia komisie, ktorú na tento účel ustanovil.
3. Riaditeľ rozhodne o odvolaní do 15 dní od jeho doručenia. Ak riaditeľ ústavu v tejto lehote nerozhodne, predpokladá sa, že vydal rozhodnutie, ktorým odvolanie zamietol a napadnuté rozhodnutie potvrdil; za deň doručenia tohto rozhodnutia sa považuje druhý deň po uplynutí lehoty na vydanie rozhodnutia.
4. Rozhodnutie o odmietnutí žiadosti možno preskúmať v súdnom konaní podľa zákona č. § 244 až 250 Občianskeho súdneho poriadku.

**Sadzobník úhrad za sprístupnenie informácií**

Informácie sa sprístupňujú bezplatne s výnimkou úhrady vo výške, ktorá nesmie prekročiť sumu materiálnych nákladov spojených so zhotovením kópií, so zadovážením technických nosičov a s odoslaním informácie žiadateľovi. Ústav odpustí úhrady nepresahujúce 0,66,- EUR (20,- Sk).

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| Internet | Zadarmo |
| Rozmnoženie 1 ČB strany | 0.03,- EUR (1,- Sk) |
| Rozmnoženie 1 farebnej strany | 0,10,- EUR (3,- Sk) |
| Na diskete | 0,50,- EUR (15,- Sk) |
| Na CD nosiči | 1,33,- EUR (40,- Sk) |

**Prehľad všeobecne záväzných právnych predpisov, pokynov, inštrukcií, výkladových stanovísk a interných normatívnych aktov, podľa ktorých ústav koná a rozhoduje**

1. zákon č. 74/1963 Zb. o Slovenskej akadémii vied v znení neskorších predpisov
2. zákon NR SR č. 278/1993 Z.z. o správe majetku štátu v znení neskorších predpisov
3. Matematický ústav 3. zákon NR SR č. 303/ 1995 Z.z. o rozpočtových pravidlách v znení neskorších predpisov
4. zákon č. 172/1990 Zb. o vysokých školách v znení neskorších predpisov
5. zákon č. 53/1964 Zb. o udeľovaní vedeckých hodností a o štátnej komisii pre vedecké hodnosti v znení neskorších predpisov
6. zákon č. 39/1977 Zb. o výchove nových vedeckých pracovníkov a o ďalšom zvyšovaní kvalifikácie v znení neskorších predpisov
7. vyhláška Československej akadémie vied č. 55/1977 Zb. o ďalšom zvyšovaní kvalifikácie a o hodnotení tvorivej spôsobilosti vedeckých pracovníkov
8. ostatné interné smernice / na internetovej stránke už sú uverejnené /

**18. Problémy a podnety pre činnosť SAV**

V roku 2021 došlo ku výraznému nárastu celkových výdavkov Matematického ústavu SAV, a to o 21,33 % oproti roku 2020 (v roku 2020 to bolo 12,71 %). V rozpočtových výdavkoch došlo ku bezvýznamnému poklesu o 0,1 % oproti nárastu 14,28 % v predchádzajúcom roku. Tento malý pokles bol daný stagnujúcim rozpočtom SAV v roku 2021. Celkový nárast bol zabezpečený nárastom mimorozpočtových prostriedkov celkove o 142,38 %. V oblasti miezd sme zaznamenali rast o 7,45 % oproti predchádzajúcemu roku, keď bol nárast 18,67 %. Rast bol síce nižší, ale platy boli na úrovni poslednej tretiny roku 2020, keď došlo ku zvýšeniu príplatkov o viac ako 25 % tarifných platov.

V roku 2021 sme vynaložili aj viac ako 149 tisíc EUR na kapitálové výdavky z toho 128 tisíc z mimorozpočtových zdrojov. Týchto 258 tisíc EUR bolo investovaných na obnovu dátovej siete v budove na Štefánikovej 49 v Bratislave.

Kapitálové výdavky sú nevyhnutné aj pri výdavkoch na jednotlivé predmety, napríklad počítače pri obstarávacej cene viac ako 1700 EUR. Táto hranica je tu ešte z obdobia pred používaním EUR a považujeme za nevyhnutné ju posunúť niekoľkonásobne vyššie. Napríklad notebooky firmy Apple bežne stoja nad 2000 EUR a pri ich zakúpení je nutné zložito komunikovať a zabezpečiť výmenu prostriedkov z kategórie 630 do 700, čo považujeme za stratu času.

Z položky tovary a služby sme presunuli 21 tisíc EUR do kategórie 700 investície. Keď odpočítame tento presun, tak v tovaroch a službách sme zaznamenali nárast o 3, 4 % oproti poklesu 8,47 % v predchádzajúcom roku

V APVV sme zaznamenali pokles o 9,28 % pri poklese 12,34 % v predchádzajúcom roku a náraste 66,7 % dva roky dozadu. Ako vidieť je tu určitá dynamika, ale APVV je v každom prípade dôležitý zdroj financovania.

V projektoch VEGA sme zaznamenali nárast financovania o 8,78 % oproti poklesu o 11,72 % v predchádzajúcom roku. Aj tu sa prejavuje dynamika v počte pracovníkov, ktorí riešia projekty VEGA

Z finančného hľadiska bol rok 2021 veľmi úspešný, ale bolo to kryté hlavne z mimorozpočtových zdrojov, čo bolo dané úspešným riešením projektov.

Prechod na v. v. i. neznamenal nejaké dramatické zmeny. Oveľa vážnejšie bolo pokračovanie COVID obdobia, ktoré je poznamenané minimálnymi osobnými kontaktami pracovníkov z ich zahraničnými partnermi, čo je v matematike veľmi dôležité.

Stále vysoko hodnotíme trvajúci prístup ku vedeckým informáciám. Dôležité bude zabezpečiť rokovanie s vydavateľmi a distribútormi na celoštátnej úrovni, aby sme dosiahli prístupu „read and publish“, t. j. pre predplatení prístupu je zdarma alebo výrazne nižší poplatok za publikovanie open access našich príspevkov.

Matematický ústav SAV má stále prístup do databázy Zentralblatt MATH, Nemecko, ktorý je teraz všeobecne bezplatný. Prístup do databázy sekundárnych informačných údajov MathSci, USA sme pre nedostatok prostriedkov v roku 2021 neobnovili.

Matematický ústav venuje veľkú pozornosť popularizácii matematiky a matematických výsledkov. Popularizačná aktivita ústavu sa v poslednom roku mierne znížila, čo je do značnej miery dané COVID obdobím.

**Správu o činnosti organizácie SAV spracoval(i):**

prof. RNDr. Anatolij Dvurečenskij, DrSc., 02/ 5751 0412

Mgr. Marek Hyčko, PhD., 02/5751 0502

doc. RNDr. Karol Nemoga, CSc., 02/ 5751 0401

Schválila vedecká rada organizácie SAV dňa 31.1.2021

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| **Riaditeľ organizácie SAV** |  | **Predseda vedeckej rady** |
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| .......................................................... |  | ................................................ |
| doc. RNDr. Karol Nemoga, CSc. |  | Mgr. Anna Jenčová, DrSc. |

**Prílohy**   
   
***Príloha A***

**Zoznam zamestnancov a doktorandov organizácie k 31.12.2021**

**Zoznam zamestnancov podľa štruktúry**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Meno s titulmi** | **Úväzok  (v %)** | **Ročný prepočítaný úväzok** |
| **Vedúci vedeckí pracovníci DrSc.** | | | |
| 1. | [prof. RNDr. Anatolij Dvurečenskij, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2372) | 100 | 1.00 |
| 2. | [doc. RNDr. Ľubica Holá, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2378) | 100 | 1.00 |
| 3. | [prof. RNDr. Juraj Hromkovič, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5689) | 100 | 0.00 |
| 4. | [RNDr. Stanislav Jakubec, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2379) | 50 | 0.50 |
| 5. | [Mgr. Anna Jenčová, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2380) | 100 | 1.00 |
| 6. | [prof. RNDr. Roman Nedela, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5699) | 45 | 0.45 |
| 7. | [doc. RNDr. Sylvia Pulmannová, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2386) | 100 | 1.00 |
| 8. | [doc. RNDr. Oto Strauch, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2389) | 60 | 0.60 |
| 9. | [prof. RNDr. Marian Vajteršic, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5725) | 100 | 0.00 |
| 10. | [prof. RNDr. Gejza Wimmer, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6723) | 100 | 1.00 |
| **Vedúci vedeckí pracovníci CSc., PhD.** | | | |
| 1. | [RNDr. Martin Kochol, PhD., DSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2601) | 100 | 1.00 |
| **Samostatní vedeckí pracovníci** | | | |
| 1. | [Mgr. Martin Bečka, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5673) | 100 | 1.00 |
| 2. | [Mgr. Natália Dilna, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=7075) | 100 | 1.00 |
| 3. | [RNDr. Stefan Dobrev, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5681) | 100 | 1.00 |
| 4. | [prof. RNDr. Michal Fečkan, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2373) | 50 | 0.50 |
| 5. | [doc. RNDr. Ján Haluška, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5687) | 100 | 1.00 |
| 6. | [prof. RNDr. Miroslav Haviar, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12402) | 11 | 0.11 |
| 7. | [RNDr. Galina Jirásková, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5691) | 100 | 1.00 |
| 8. | [doc. Mgr. Ján Karabáš, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5693) | 20 | 0.20 |
| 9. | [prof. RNDr. Július Korbaš, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=3819) | 3 | 0.03 |
| 10. | [doc. RNDr. Karol Nemoga, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2369) | 100 | 1.00 |
| 11. | [doc. Ing. Gabriel Okša, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5701) | 100 | 1.00 |
| 12. | [doc. RNDr. Milan Paštéka, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6691) | 3 | 0.03 |
| 13. | [RNDr. Jozef Pócs, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5704) | 100 | 1.00 |
| 14. | [RNDr. Michal Pospíšil, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6622) | 20 | 0.20 |
| 15. | [doc. RNDr. Miroslav Repický, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5707) | 100 | 1.00 |

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| **Samostatní vedeckí pracovníci (pokr.)** | | | |
| 16. | [Mgr. Andrea Zemánková, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5731) | 100 | 1.00 |
| **Vedeckí pracovníci** | | | |
| 1. | [doc. RNDr. Vladimír Baláž, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6707) | 1 | 0.01 |
| 2. | [doc. Mgr. Pavol Bokes, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11621) | 13 | 0.13 |
| 3. | [RNDr. Katarína Čunderlíková, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11192) | 100 | 0.90 |
| 4. | [RNDr. Vladimír Dančík, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6710) | 100 | 0.00 |
| 5. | [RNDr. Peter Eliaš, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5682) | 100 | 1.00 |
| 6. | [doc. RNDr. Rudolf Hajossy, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6702) | 32 | 0.32 |
| 7. | [RNDr. Emília Halušková, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5688) | 100 | 1.00 |
| 8. | [Ing. Michal Hospodár, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=10212) | 100 | 1.00 |
| 9. | [Mgr. Marek Hyčko, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5521) | 100 | 1.00 |
| 10. | [Ing. Irena Jadlovská, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12670) | 100 | 0.50 |
| 11. | [Mgr. Michaela Koščová, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12414) | 20 | 0.08 |
| 12. | [doc. Mgr. Tibor Macko, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5697) | 25 | 0.25 |
| 13. | [doc. Mgr. Ján Mačutek, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12165) | 100 | 1.00 |
| 14. | [RNDr. Alžbeta Michalíková, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11193) | 11 | 0.05 |
| 15. | [Mgr. Peter Mlynárčik, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=9397) | 11 | 0.11 |
| 16. | [Ing. Igor Mračka, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=7987) | 100 | 1.00 |
| 17. | [Mgr. Branislav Novotný, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5700) | 100 | 1.00 |
| 18. | [RNDr. Igor Odrobina, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12404) | 100 | 1.00 |
| 19. | [doc. PaedDr. Martin Papčo, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=8050) | 5 | 0.05 |
| 20. | [RNDr. Jozefína Petrovičová, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12412) | 5 | 0.05 |
| 21. | [RNDr. Martin Plávala, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=10048) | 100 | 0.00 |
| 22. | [Mgr. Eva Plávalová, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11194) | 3 | 0.03 |
| 23. | [Mgr. Ladislav Stacho, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5714) | 100 | 0.00 |
| 24. | [doc. Ondrej Šuch, PhD., M.Sc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5716) | 25 | 0.25 |
| 25. | [Mgr. Elena Vinceková, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5727) | 100 | 1.00 |
| 26. | [RNDr. Tibor Žáčik, CSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2368) | 100 | 1.00 |
| **Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)** | | | |
| 1. | [Ing. Ferdinand Čapka](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11918) | 3 | 0.03 |
| 2. | [Ing. Iveta Červenková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12407) | 33 | 0.33 |
| 3. | [Mgr. Ing. Jean Rosemon Dora](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12702) | 100 | 0.33 |
| 4. | [Ing. Peter Sýs](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11919) | 3 | 0.03 |

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| **Odborní pracovníci s VŠ vzdelaním (ostatní zamestnanci)** | | | |
| 1. | [Mgr. Zdeno Grešo](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12184) | 60 | 0.00 |
| 2. | [RNDr. Dana Kákošová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11784) | 100 | 1.00 |
| 3. | [RNDr. Alexandra Mojžišová, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11198) | 100 | 1.00 |
| 4. | [Ing.arch. Terézia Sedláková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6653) | 59 | 0.00 |
| **Odborní pracovníci ÚSV** | | | |
| 1. | [Marianna Bečková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12405) | 60 | 0.00 |
| 2. | [Jana Galbová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=10283) | 60 | 0.60 |
| 3. | [Ivana Geriaková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2423) | 100 | 1.00 |
| 4. | [Ivana Hudecová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=7230) | 60 | 0.60 |
| 5. | [Zuzana Kvapilová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11783) | 100 | 1.00 |
| 6. | [Katarína Nagyová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6694) | 60 | 0.60 |
| 7. | [Eugénia Ondrušková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=2374) | 100 | 1.00 |
| 8. | [Bc. Henrieta Paľová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6720) | 24 | 0.24 |
| 9. | [Katarína Štefančíková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5719) | 100 | 1.00 |
| **Ostatní pracovníci** | | | |
| 1. | [Janka Badiarová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6709) | 33 | 0.33 |
| 2. | [Lucia Mišíková](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=6716) | 36 | 0.36 |
| 3. | [Ing. Juraj Prochác](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=12403) | 100 | 1.00 |
| 4. | [Beata Szabová](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11196) | 100 | 1.00 |

**Zoznam zamestnancov, ktorí odišli v priebehu roka**

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|  | **Meno s titulmi** | **Dátum odchodu** | **Ročný prepočítaný úväzok** |
| **Vedúci vedeckí pracovníci DrSc.** | | | |
| 1. | [doc. RNDr. Roman Frič, DrSc.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=5683) | 13.1.2021 | 0.00 |
| **Vedeckí pracovníci** | | | |
| 1. | [Mgr. Marek Košta, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=11195) | 30.6.2021 | 0.00 |
| 2. | [Mgr. Matúš Palmovský, PhD.](https://www.sav.sk/index.php?lang=sk&charset=&doc=org-user&user_no=9398) | 30.6.2021 | 0.01 |

**Zoznam doktorandov**

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|  | **Meno s titulmi** | **Škola/fakulta** | **Študijný odbor** |
| **Interní doktorandi hradení z prostriedkov SAV** | | | |
| 1. | Ing. Ferdinand Čapka | Fakulta matematiky, fyziky a informatiky UK | 9.1.9 aplikovaná matematika |
| 2. | Mgr. Jean Rosemond Dora | Fakulta matematiky, fyziky a informatiky UK | 9.1.9 aplikovaná matematika |
| 3. | Mgr. Viktor Olejár | Fakulta matematiky, fyziky a informatiky UK | 9.1.9 aplikovaná matematika |
| 4. | Ing. Peter Sýs | Fakulta matematiky, fyziky a informatiky UK | 9.1.9 aplikovaná matematika |
| **Interní doktorandi hradení z iných zdrojov** | | | |
| *organizácia nemá interných doktorandov hradených z iných zdrojov* | | | |
| **Externí doktorandi** | | | |
| *organizácia nemá externých doktorandov* | | | |

**Zoznam zamestnancov prijatých do jedného roka od získania PhD.**

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|  | **Meno s titulmi** | **Dátum obhajoby** | **Dátum prijatia** | **Úväzok  (v %)** |
| 1. | Ing. Irena Jadlovská, PhD. | 29. 05. 2020 | 01. 07. 2021 | 100 |

**Zoznam emeritných vedeckých zamestnancov**

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|  | **Meno s titulmi** |

***Príloha B***   
**Projekty riešené v organizácii**

**Medzinárodné projekty**

**Programy: Medziakademická dohoda (MAD)**

**1.) Tvorba a aplikácie pravdepodobnostných a intuitionistických fuzzy modelov neurčitosti** *(Generation and applications of probabilistic and intuitionistic fuzzy models of uncertainty)*

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| **Zodpovedný riešiteľ:** | Katarína Čunderlíková |
| **Trvanie projektu:** | 1.1.2021 / 31.12.2022 |
| **Evidenčné číslo projektu:** | SAS-BAS-21-01 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 2 - Bulharsko: 1, Slovensko: 1 |
| **Čerpané financie:** | SAV: 2000 € |

*Dosiahnuté výsledky:*

V rámci projektu sme skúmali podmienenú strednú hodnotu a pravdepodobnosť a s nimi súvisiacu martingálovú kovergenčnú vetu na zovšeobecnených štruktúrach ako intuitionistické fuzzy množinách a intervalovo hodnotových fuzzy množinách.

1. K. Čunderlíková, *Conditional intuitionistic fuzzy mean value*, Axioms **10** (2) (2021), Art. Num. 97, 1–8. DOI: [30.3390/axioms10020097](https://doi.org/30.3390/axioms10020097)
2. K. Čunderlíková, *Martingale convergence theorem for a conditional intuitionistic fuzzy mean value*, Notes on Intuitionistic Fuzzy Sets **27** (2) (2021), 94-102.   
   DOI: [10.7546/nifs.2021.27.2.94-102](https://doi.org/10.7546/nifs.2021.27.2.94-102)
3. K. Čunderlíková, *Conditional interval valued probability and martingale convergence theorem*, Atlantis Studies in Uncertainty Modelling 3. Radko Mesiar, Marek Reformat, Martin Štěpnička, Petr Hurtik (eds.) - Atlantis Press, 2021, p. 517-522. ISBN 978-94-6239-423-0.

DOI: [10.2991/asum.k.210827.068](https://doi.org/10.2991/asum.k.210827.068)

1. A. Michalíková, E. Szmidt, P. Vassilev, *Modifications of Łukasiewicz’s intuitionistic fuzzy implication*, Notes on Intuitionistic Fuzzy Sets. Academic Publishing House, Sofia, Bulgaria. Volume **27** (3) (2021), 32–39. DOI: [10.7546/nifs.2021.27.3.32-39](http://doi.org/10.7546/nifs.2021.27.3.32-39)

**2.) Matematické modely neurčitosti a ich aplikácie** *(Mathematical models of uncertainty and their applications)*

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| **Zodpovedný riešiteľ:** | Alžbeta Michalíková |
| **Trvanie projektu:** | 1.1.2019 / 31.12.2022 |
| **Evidenčné číslo projektu:** |  |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 2 - Poľsko: 1, Slovensko: 1 |
| **Čerpané financie:** | - |

*Dosiahnuté výsledky:*

V projekte sme skúmali druhy konvergencie na zovšeobecnených štruktúrach ako sú intuitionistické fuzzy množiny.

1. K. Čunderlíková, *A note on mean value and dispersion of intuitionistic fuzzy events*, Notes on Intuitionistic Fuzzy Sets, 2020, vol. **26**, no. 4, p. 1–8. ISSN 1310-4926.

DOI: [10.7546/nifs.2020.26.4.1-8](https://doi.org/10.7546/nifs.2020.26.4.1-8)

1. K. Čunderlíková, B. Riečan, *Convergence of Intuitionistic Fuzzy Observables*, Advances in Intelligent Systems and Computing.Uncertainty and Imprecision in Decision Making and Decision Support: New Challenges, Solutions and Perspectives. - Cham : Springer, 2021, vol. **1081**, p. 29-39. ISBN 978-3-030-47023-4. ISSN 2194-5357.

DOI: [10.1007/978-3-030/47024-1\_4](https://doi.org/10.1007/978-3-030/47024-1_4)

1. K. Čunderlíková*, Intuitionistic Fuzzy Probability and Almost Everywhere Convergence*, Advances in Intelligent Systems and Computing.Advances and New Developments in Fuzzy Logic and Technology. Eds. Krassimir T. Atanassov, Vassia Atanassova, Janusz Kacprzyk, Andrzej Kaluszko, Maciej Krawczak, Jan W. Owsinski, Sotir S. Sotirov, Evdokia Sotirova, Eulalia Szmidt, Slawomir Zadrozny. - Cham : Springer, 2021, vol. **1308**, p. 54–65. ISBN 978-3-030-77715-9. ISSN 2194-5357. DOI: [10.1007/978-3-030-77716-6\_5](https://doi.org/10.1007/978-3-030-77716-6_5)
2. A. Michalíková, *Classification of Images by Using Distance Functions Defined on Intuitionistic Fuzzy Sets*, Atanassov K.T. et al. (eds) Advances and New Developments in Fuzzy Logic and Technology. IWIFSGN 2019 2019. Advances in Intelligent Systems and Computing, vol **1308**. Springer, Cham., 2021, 66–74. DOI: [10.1007/978-3-030-77716-6\_6](https://doi.org/10.1007/978-3-030-77716-6_6)
3. A. Michalíková, B. Riečan, *On States on Fuzzy MV-algebra*, Advances in Intelligent Systems and Computing.Uncertainty and Imprecision in Decision Making and Decision Support: New Challenges, Solutions and Perspectives. - Cham : Springer, 2021, vol. **1081**, p. 40–46. ISBN 978-3-030-47023-4. DOI: [10.1007/978-3-030-47024-1\_5](https://doi.org/10.1007/978-3-030-47024-1_5)

**Programy: Medzivládna dohoda**

**3.) Frekvencia a skloňovanie v slovanských jazykoch (ruština, slovenčina, slovinčina)** *(Frequency and declensional morphology in Slavic languages (Russian, Slovak and Slovene))*

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| **Zodpovedný riešiteľ:** | Ján Mačutek |
| **Trvanie projektu:** | 1.4.2021 / 31.12.2022 |
| **Evidenčné číslo projektu:** | SK-AT-20-0003 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 2 - Rakúsko: 1, Slovensko: 1 |
| **Čerpané financie:** | APVV: 150 € |

*Dosiahnuté výsledky:*

**Programy: ERANET**

**4.) Dátami vedené hľadanie liečiv pre hojenie rán** *(Data-Driven Drug Discovery For Wound Healing)*

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| **Zodpovedný riešiteľ:** | Branislav Novotný |
| **Trvanie projektu:** | 1.6.2018 / 31.5.2021 |
| **Evidenčné číslo projektu:** |  |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | Biodonostia Health Research Institute, Computational Biology and Systems Biomedicine Group |
| **Počet spoluriešiteľských inštitúcií:** | 7 - Rakúsko: 2, Nemecko: 1, Španielsko: 1, Veľká Británia: 2, Slovensko: 0, Slovinsko: 1 |
| **Čerpané financie:** | ERA.NET: 8333 € |

*Dosiahnuté výsledky:*

V úzkej spolupráci s partnermi projektu vyvinul slovenský tím na Matematickom ústave SAV novú metódu integrácie údajov kožnej transkriptomiky založenú na transformácii inšpirovanej fuzzy logikou. Tím tiež získal teoretické výsledky o distribúcii génovej expresie pre doprednú slučku mRNA - mikroRNA, systém spätnej väzby podobný fuzzy a obvod oneskorenej spätnej väzby. Výsledky boli šírené na vedeckých konferenciách a teoreticky orientovaných časopisoch.

1. C. Celik, P. Bokes, A. Singh, *Protein noise and distribution in a two-stage gene-expression model extended by an mRNA inactivation loop*, Computational Methods in Systems Biology: Proceedings LNCS **12881**. - Springer International Publishing, 2021, 215–229. ISBN 978-3-030-85632-8. DOI: [10.1007/978-3-030-85633-5\_13](https://doi.org/10.1007/978-3-030-85633-5_13)
2. P. Bokes, A. Singh, *A modified fluctuation test for elucidating drug resistance in microbial and cancer cells*, European Journal of Control **62** (2021), 130–135.

DOI: [10.1016/j.ejcon.2021.06.018](https://doi.org/10.1016/j.ejcon.2021.06.018)

1. P. Bokes, *Heavy-tailed distributions in a stochastic gene autoregulation model*, Journal of Statistical Mechanics-theory and experiment **11** (2021), Art. Num. 113403.

DOI: [10.1088/1742-5468/ac2edb](https://doi.org/10.1088/1742-5468/ac2edb)

1. B. Novotný, M. Nagy, E. Kurin, *Synergy evaluation of non-normalizable dose-response data: Generalization of combination index for the linear effect of drugs*, Pharmaceutical Statistics **20** (2021), 982–989. DOI: [10.1002/pst.2118](https://doi.org/10.1002/pst.2118)

**Domáce projekty**

**Programy: VEGA**

**1.) Modely a algoritmy pre výpočty s neúplnou informáciou** *(Models and algorithms for computing with incomplete information)*

|  |  |
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| **Zodpovedný riešiteľ:** | Stefan Dobrev |
| **Trvanie projektu:** | 1.1.2020 / 31.12.2023 |
| **Evidenčné číslo projektu:** | VEGA 1/0601/20 |

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| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | FMFI UK |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | VEGA SAV: 1942 € |

*Dosiahnuté výsledky:*   
   
   
**2.) Kvalitatívne vlastnosti a bifurkácie diferenciálnych rovníc a dynamických systémov** *(Qualitative properties and bifurcations of differential equations and dynamical system)*

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| **Zodpovedný riešiteľ:** | Michal Fečkan |
| **Trvanie projektu:** | 1.1.2020 / 31.12.2023 |
| **Evidenčné číslo projektu:** | VEGA 2/0127/20 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | VEGA SAV: 10485 € |

*Dosiahnuté výsledky:*

1. F. Battelli, M. Fečkan, *Periodic solutions in slowly varying discontinuous differential equations: the generic case*, Mathematics **9** (19) (2021), Art. Num. 2449.  
   DOI: [10.3390/math9192449](https://doi.org/10.3390/math9192449)
2. X. Cao, M. Fečkan, D. Shen, J. Wang, *Iterative learning control for multi-agent systems with impulsive consensus tracking*, Nonlinear Analysis: Modelling and Control **26** (1) (2021), 130–150. DOI: [10.15388/namc.2021.26.20981](https://doi.org/10.15388/namc.2021.26.20981)
3. N. Dilna, A. Dvurečenskij, *Michal Fečkan (on his 60th birthday)*. Nonlinear Oscillations, **24** (1) 2021, 141–144.
4. N. Dilna, A. Dvurečenskij, *Prof. RNDr. Michal Fečkan, Dr.Sc. - Sexagenarian?* Mathematica Slovaca **71** (2) (2021), 265–266. DOI: [10.1515/ms-2017-0465](https://doi.org/10.1515/ms-2017-0465)
5. M. F. Danca, M. Fečkan, N. Kuznetsov, G. Chen, *Coupled discrete fractional-order logistic maps*, Mathematics **9** (18) (2021), 1–13. DOI: [10.3390/math9182204](https://doi.org/10.3390/math9182204)
6. M. F. Danca, M. Fečkan, N. Kuznetsov, G. Chen, *Attractor as a convex combination of a set of attractors*, Communications in nonlinear science and numerical simulation **96** (2021), Art. Num. 105721, p. 1–11. DOI: [10.1016/j.cnsns.2021.105721](https://doi.org/10.1016/j.cnsns.2021.105721)
7. M. Fečkan, J. Wang, H. Y. Zhao, *Maximal and minimal nondecreasing bounded solutions of iterative functional differential equations*, Applied Mathematics Letters **113** (2021),   
   1–7. DOI: [10.1016/j.aml.2020.106886](https://doi.org/10.1016/j.aml.2020.106886)
8. Y. Guan, J. Wang, M. Fečkan, *Explicit solution and dynamical properties of atmospheric Ekman flows with boundary conditions*, Electronic Journal of Qualitative Theory of Differential Equations **30** (2021), p. 1–19. DOI: [10.14232/ejqtde.2021.1.30](https://doi.org/10.14232/ejqtde.2021.1.30)
9. Y. Guan, M. Fečkan, J. Wang, *Periodic solutions and Hyers-Ulam stability of atmospheric Ekman flows*, Discrete and Continuous Dynamical Systems **41** (3) (2021), 1157–1176. DOI: [10.3934/dcds.2020313](https://doi.org/10.3934/dcds.2020313)
10. P. Hasil, J. Kiseľák, M. Pospíšil, M. Veselý, *Nonoscillation of half-linear dynamic equations on time scales*. Mathematical Methods in the Applied Sciences **44** (11) (2021), 8775–8797. DOI: [10.1002/mma.7304](https://doi.org/10.1002/mma.7304)
11. Y. Si, M. Fečkan, J. Wang, D. O'Regan, *Relative controllability of delay multi-agent systems*, International Journal of Robust and Nonlinear Contro **31** (2021), p. 4965–4993. DOI: [10.1002/rnc.5517](https://doi.org/10.1002/rnc.5517)
12. L. Suo, M. Fečkan, J. Wang, *Quaternion-valued linear impulsive differential equations*, Qualitative Theory of Dynamical Systems **20** (2021), p. 1–78.

DOI: [10.1007/s12346-021-00467-9](https://doi.org/10.1007/s12346-021-00467-9)

1. J. Wang, M. Fečkan, Q. Wen, D. O'Regan, *Existence and uniqueness results for modeling jet flow of the antarctic circumpolar current*, Monatshefte für Mathematik **194** (2021), 601–621. DOI: [10.1007/s00605-020-01493-6](https://doi.org/10.1007/s00605-020-01493-6)
2. J. Wang, W. Zhang, M. Fečkan, *Periodic boundary value problem for second-order differential equations from geophysical fluid flows*, Monatshefte für Mathematik **195** (2021), 523–540. DOI: [s00605-021-01539-3](https://doi.org/10.1007/s00605-021-01539-3)
3. J. Wang, M. Fečkan,W. Zhang, *On the nonlocal boundary value problem of geophysical fluid flows*, Zeitschrift für angewandte Mathematik und Physik **72** (1) (2021), Art. Num. 27. DOI: [10.1007/s00033-020-01452-z](https://doi.org/10.1007/s00033-020-01452-z)
4. Z. You, M. Fečkan, J. Wang, *On the relative controllability of neutral delay differential equations*, Journal of Mathematical Physics **62** (2021), Art. No. 082704.   
   DOI: [10.1063/5.0055722](https://doi.org/10.1063/5.0055722)
5. H. Y. Zhao, M. Fečkan, *Analytic invariant curves for an iterative equation related to Ricker-type second-order equation*, Acta Mathematica Sinica **37** (7) (2021), 1041–1052. DOI: [10.1007/s10114-021-8530-x](https://doi.org/10.1007/s10114-021-8530-x)
6. X. Wang, M. Fečkan, J. Wang, *Forecasting economic growth of the Group of seven via fractional-order gradient descent approach*, Axioms **10** (4) (2021), Art. Num. 257. DOI: [10.3390-axioms10040257](https://doi.org/10.3390-axioms10040257)
7. Ö. Ak Gümüs, M. Fečkan, Stability, *Neimark-Sacker bifurcation and chaos control for a prey-predator system with harvesting effect on predator*, Miskolc Mathematical Notes **22** (2) (2021), 663–679. DOI: [10.18514/MMN.2021.3450](https://doi.org/10.18514/MMN.2021.3450)
8. M. Fečkan, X. Wang, J. Wang, *Data-driven analysis and prediction of fractional order SIR model for COVID-19*, Numerical Analysis and Applicable Mathematics **2** (3) (2021), 9–17.DOI: [10.36686/Ariviyal.NAAM.2021.02.03.009](https://doi.org/10.36686/Ariviyal.NAAM.2021.02.03.009)
9. M. Pospíšil, *Note on fractional difference equations with periodic and S-asymptotically periodic right-hand side*, Nonlinear Oscillations **24** (1) (2021), Art. Num. 1339, 99–109.
10. Ch. Derbazi, Z. Baitiche, M. Fečkan, *Some new uniqueness and Ulam stability results for a class of multiterms fractional differential equations in the framework of generalized Caputo fractional derivative using the Φ-fractional Bielecki-type norm*, Turkish Journal of Mathematics **45** (2021), 2307–2322. DOI: [10.3906/mat-2011-92](https://doi.org/10.3906/mat-2011-92)
11. F. Miao, M. Fečkan, J. Wang, *A new approach to study constant vorticity water flows in the β-plane approximation with centripetal forces*, Dynamics of Partial Differential Equations **18** (3) (2021), 199–210. DOI: [10.4310/DPDE.2021.v18.n3.a2](https://doi.org/10.4310/DPDE.2021.v18.n3.a2)
12. A. Seemab, M. Rehman, M. Fečkan, J. Alzabut, S. Abbas, *On the existence and Ulam–Hyers stability of a new class of (ϕ, χ)-fractional differential equations with impulses*, Filomat **35** (6) (2021), 1977–1991. DOI: [10.2298/FIL2106977S](https://doi.org/10.2298/FIL2106977S)

**3.) Topologické štruktúry na priestoroch funkcií**

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| **Zodpovedný riešiteľ:** | Ľubica Holá |
| **Trvanie projektu:** | 1.1.2021 / 31.12.2024 |
| **Evidenčné číslo projektu:** | VEGA 2/0048/21 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | VEGA SAV: 5115 € |

*Dosiahnuté výsledky:*

1. Ľ. Holá, *There are 2c Quasicontinuous Non-Lebesgue Measurable Functions*, Results Math **76** (3) (2021), Art. Num. 126.DOI: [10.1007/s00025-021-01440-3](https://doi.org/10.1007/s00025-021-01440-3)

V článku: sme dokázali, že keď X je nespočítateľný Poľský priestor alebo lokálne pathwise connected perfektne normálny priestor s aspoň jedným neizolovaným bodom, tak existuje kvázispojitá borelovsky nemerateľná funkcia z X do [0,1]. Tiež sme dokázali, že na nespočítateľnom Poľskom priestore existuje 2c kvázispojitých funkcií, ktoré nie sú borelovské. Našli sme nové podmienky, pri ktorých pre každú kvázispojitú funkciu existuje ekvivalentná kvázispojitá Borelovsky merateľná funkcia.

1. Dokázali sme, že priestory minimálnych usco a minimálnych cusco zobrazení z lokálne kompaktného priestoru do Fréchetovho priestoru, vybavené topológiou rovnomernej konvergencie na kompaktoch, sú izomorfné ako topologické vektorové priestory.

**4.) Teória čísel a jej aplikácie** *(Number Theory and Its Applications)*

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Stanislav Jakubec |
| **Trvanie projektu:** | 1.1.2018 / 31.12.2021 |
| **Evidenčné číslo projektu:** | VEGA 2/0109/18 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | VEGA SAV: 7013 € |

*Dosiahnuté výsledky:*

1. J. R. Dora, K. Nemoga, *Clone node detection attacks and mitigation mechanisms in static wireless sensor networks*, Journal of Cybersecurity and Privacy **1** (4) (2021), 553–579. DOI: [10.3390/jcp1040028](https://doi.org/10.3390/jcp1040028)
2. J. R. Dora, K. Nemoga, *Ontology for cross-site-scripting (XSS) attack in cybersecurity*, Journal of Cybersecurity and Privacy **1** (2) (2021), 319–339.

DOI: [10.3390/jcp1020018](https://doi.org/10.3390/jcp1020018)

1. L. Mišík, Š. Porubský, O. Strauch, *Uniform distribution of the weighted sum-of-digits functions*, Uniform Distribution Theory **16** (1) (2021), 93–126.

DOI: [10.2478/udt-2021-0005](https://doi.org/10.2478/udt-2021-0005)

1. O. Strauch, *Mahler's conjecture on ξ(3/2)n  mod 1*, Unif. Distrib. Theory **16** (2) (2021), 49–70. DOI: [10.2478/udt-2021-0007](https://doi.org/10.2478/udt-2021-0007)

**5.) Matematické modely neklasických javov a neurčitosti** *(Mathematical models of non-classical events and uncertainty)*

|  |  |
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| **Zodpovedný riešiteľ:** | Anna Jenčová |
| **Trvanie projektu:** | 1.1.2020 / 31.12.2023 |
| **Evidenčné číslo projektu:** | VEGA 2/0142/20 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | VEGA SAV: 10656 € |

*Dosiahnuté výsledky:*

1. G. Aubrun, L. Lami, C. Palazuelos, M. Plávala, *Entangleability of cones*, Geom. Funct. Anal. **31** (2021), 181–205. DOI: [10.1007/s00039-021-00565-5](https://doi.org/10.1007/s00039-021-00565-5)
2. N. Dilna, A. Dvurečenskij, *Michal Fečkan (on his 60th birthday)*. Nonlinear Oscillations, **24** (1) 2021, 141–144.
3. N. Dilna, A. Dvurečenskij, *Prof. RNDr. Michal Fečkan, Dr.Sc. - Sexagenarian?* Mathematica Slovaca **71** (2) (2021), 265–266. DOI: [10.1515/ms-2017-0465](https://doi.org/10.1515/ms-2017-0465)
4. A. Di Nola, A. Dvurečenskij, S. Lapenta, *An approach to stochastic processes via non-classical logic*, Ann. Pure Appl. Logic. **172** (2021), Art. Num. 103012.

DOI: [10.1016/j.apal.2021.103012](https://doi.org/10.1016/j.apal.2021.103012%20)

1. Dvurečenskij, *Sum of n-dimensional observables on MV-effect algebras*, Soft Computing **25** (2021), 8073–8084. DOI: [10.1007/s00500-021-05911-1](https://doi.org/10.1007/s00500-021-05911-1)
2. A. Dvurečenskij, O. Zahiri, *Weak pseudo EMV-algebras.* I. *Basic properties*, J. Appl. Logic — IfCoLog Journal of Logics and their Applications **8** (2021), 2365–2399.
3. A. Dvurečenskij, O. Zahiri, *Weak pseudo EMV-algebras.* II. *Representation and subvarieties*, J. Appl. Logic — IfCoLog Journal of Logics and their Applications **8** (2021), 2401–2433.
4. M. Girard, M. Plávala, J. Sikora, *Jordan products of quantum channels and their compatibility*, Nat Commun **12** (2021), Art. Num. 2129.

DOI: [10.1038/s41467-021-22275-0](https://doi.org/10.1038/s41467-021-22275-0)

1. A. Jenčová, *Rényi relative entropies an noncommutative Lp-spaces* II, Annales Henri Poincaré **22** (2021), 3235–3254. DOI: [10.1007/s00023-021-01074-9](https://doi.org/10.1007/s00023-021-01074-9)
2. A. Jenčová, *A general theory of comparison of quantum channels (and beyond)*, IEEE Transactions on Information Theory **67** (2021), 3945–3964, Art. Num. 9391724.   
   DOI: [10.1109/TIT.2021.3070120](https://doi.org/10.1109/TIT.2021.3070120)
3. A. Jenčová, S. Pulmannová, *Observables on synaptic algebras*, Fuzzy Sets and Systems **406** (2021), 93–106. DOI: [10.1016/j.fss.2020.05.015](https://doi.org/10.1016/j.fss.2020.05.015)
4. A. Jenčová, S. Pulmannová, *Geometric and algebraic aspects of spectrality in order unit spaces: A comparison*, Journal of Mathematical Analysis and Applications **504** (2021), Art. Num. 125360. DOI: [10.1016/j.jmaa.2021.125360](https://doi.org/10.1016/j.jmaa.2021.125360)
5. A. Jenčová, S. Pulmannová, *Tensor product of dimension effect algebras*, Order **38** (2021), 377–389. DOI: [10.1007/s11083-020-09546-z](https://doi.org/10.1007/s11083-020-09546-z)

**6.) Popisná a výpočtová zložitosť formálnych jazykov** *(Descriptive and Computational Complexity of Formal Languages)*

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Galina Jirásková |
| **Trvanie projektu:** | 1.1.2019 / 31.12.2022 |
| **Evidenčné číslo projektu:** | VEGA 2/0132/19 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | VEGA SAV: 4532 € |

*Dosiahnuté výsledky:*

1. M. Holzer, M. Hospodár, *Power, positive closure, and quotients on convex languages*, Theoretical Computer Science, **870** (2021), 53–74. DOI: [10.1016/j.tcs.2021.02.002](https://doi.org/10.1016/j.tcs.2021.02.002)
2. M. Hospodár, *Power, positive closure, and quotients on convex languages*, Theoretical Computer Science **870** (2021), 53–74. DOI: [10.1016/j.tcs.2021.02.002](https://doi.org/10.1016/j.tcs.2021.02.002)
3. G. Jirásková, C. Câmpeanu, *Special Issue on Implementation and Application of Automata: Preface*, Theoretical Computer Science 870 (2021), 1–2.

DOI: [10.1016/j.tcs.2021.05.001](https://doi.org/10.1016/j.tcs.2021.05.001)

**7.) Chromatické problémy v kombinatorike** *(Chromatic Problems in Combinatorics)*

|  |  |
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| **Zodpovedný riešiteľ:** | Martin Kochol |
| **Trvanie projektu:** | 1.1.2018 / 31.12.2021 |
| **Evidenčné číslo projektu:** | VEGA 2/0024/18 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | VEGA SAV: 1279 € |

*Dosiahnuté výsledky:*

1. M. Kochol, *Bounds of characteristic polynomials of regular matroids*, Contributions to Discrete Mathematics **15** (3) (2020), 98–107. DOI: [10.11575/cdm.v15i3.69350](https://doi.org/10.11575/cdm.v15i3.69350)

**8.) Rozdelenia pravdepodobnosti a ich aplikácie v modelovaní a testovaní** *(Probability Distributions and their Applications in Modeling and Testing)*

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Ján Mačutek |
| **Trvanie projektu:** | 1.1.2021 / 31.12.2023 |
| **Evidenčné číslo projektu:** | 2/0096/21 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 3 - Slovensko: 3 |
| **Čerpané financie:** | VEGA SAV: 3498 € |

*Dosiahnuté výsledky:*

1. R. Čech, P. Kosek, J. Mačutek, M. Nogolová, *(Ne)stabilita českého biblického překladu: diachronní stylometrická analýza*, Clavibus unitis, 2021, vol. 10, no. 2, 151–156. ISSN 1803-7747.
2. R. Čech, J. Mačutek, P. Kosek, *Czech translations of the Gospel of Matthew from the diachronic point of view – Plus ça change…*, Jazykovedný časopis, 2021, roč. 72, č. 2, s. 656–666. DOI: [10.2478/jazcas-2021-0059](https://doi.org/10.2478/jazcas-2021-0059)
3. R. Čech, P. Kosek, O. Navrátilová, J. Mačutek, *On the impact of the initial phrase length on the position of enclitics in Old Czech*, Language and Text: Data, models, information and applications. - Amsterdam : John Benjamin Publishing Company, 2021, p. 9–20. ISBN 978-90-272-1010-4. DOI: [10.1075/cilt.356.01cec](https://doi.org/10.1075/cilt.356.01cec)
4. I. Košč, M. Koščová, M. Odlerová, R. Odler, *Changes in the education process reflecting the crisis*, Kharkiv National University of Internal Affairs: 20 years in the status of national. Proceedings of international scientific and practical conference, 2021, 44–47.
5. I. Košč, M. Koščová, M. Odlerová, R. Odler, *Specialties of remote educational process at Academy of the Police Force in the time of crisis situation*, INTED2021 Proceedings : 15th International Technology, Education and Development Conference, 3591–3599. - IATED Academy, 2021. ISBN 978-84-09-27666-0. ISSN 2340-1079.

DOI: [10.21125/inted.2021.0747](http://doi.org/10.21125/inted.2021.0747)

1. M. Kubát, Š. Netolická, R. Čech, J. Mačutek, *Martin of Cochem´s Golden Key of Heaven and its Czech Relatives: Quantitative Analysis of Baroque Prayers*,Bohemistyka, 2021, vol. 3, p. 283–294. ISSN 1642-9893. DOI: [10.14746/bo.2021.3](https://doi.org/10.14746/bo.2021.3).
2. K. Pelegrinová, J. Mačutek, R. Čech, *The Menzerath-Altmann law as the relation between lengths of words and morphemes in Czech*, In Jazykovedný časopis, 2021, roč. 72, č. 2, s. 405–414. ISSN 0021-5597. DOI: [10.2478/jazcas-2021-0037](https://doi.org/10.2478/jazcas-2021-0037)
3. B. Rujevic, M. Kaplar, S. Kaplar, R. Stankovic, I. Obradovic, J. Mačutek, *Quantitative analysis of syllable properties in Croatian, Serbian, Russian, and Ukrainian* Language and Text: Data, models, information and applications. - Amsterdam: John Benjamin Publishing Company, 2021, p. 55–67. ISBN 978-90-272-1010-4.

DOI: [10.1075/cilt.356.04ruj](https://doi.org/10.1075/cilt.356.04ruj)

**9.) Grafové invarianty, symetrie a ohodnotenia** *(Graph invariants, symmetries and labellings)*

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| **Zodpovedný riešiteľ:** | Roman Nedela |
| **Trvanie projektu:** | 1.1.2020 / 31.12.2023 |
| **Evidenčné číslo projektu:** | VEGA 2/0078/20 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | VEGA SAV: 1385 € |

*Dosiahnuté výsledky:*

1. I. Estélyi, J. Karabáš, R. Nedela, A. Mednykh, *On representation of the automorphism group of a graph in a unimodular group*, Discrete Mathematics **344** (2021), Art. Num. 112606. DOI: [10.1016/j.disc.2021.112606](https://doi.org/10.1016/j.disc.2021.112606)
2. M. Haviar, S. Kurtulík, *A new class of graceful graphs: k-enriched fan graphs and their characterisations*, CUBO: A Mathematical Journal **23** (2) (2021), 313–331.

DOI: [10.4067/S0719-06462021000200313](https://doi.org/10.4067/S0719-06462021000200313)

**10.) Konvergencia blokových algoritmov pre kanonické dekompozície matíc**

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| **Zodpovedný riešiteľ:** | Gabriel Okša |
| **Trvanie projektu:** | 1.1.2020 / 31.12.2022 |
| **Evidenčné číslo projektu:** | 2/0015/20 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | VEGA SAV: 4440 € |

*Dosiahnuté výsledky:*

1. Y. Yamamoto, G. Okša, M. Vajteršic, *On convergence to eigenvalues and eigenvectors in the block-Jacobi EVD algorithm with dynamic ordering*, Linear Algebra and Its Applications **622** (2021), 19–45. DOI: [10.1016/j.laa.2021.03.027](https://doi.org/10.1016/j.laa.2021.03.027)

**11.) Algebrické a topologické aspekty agregačných funkcií**

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| **Zodpovedný riešiteľ:** | Jozef Pócs |
| **Trvanie projektu:** | 1.1.2020 / 31.12.2023 |
| **Evidenčné číslo projektu:** | VEGA 2/0097/20 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | VEGA SAV: 8525 € |

*Dosiahnuté výsledky:*

1. R. Halaš, Z. Kurač, J. Pócs, *On the minimality of some generating sets of the aggregation clone on a finite chain*, Information Sciences **564** (2021), 193–201.   
   DOI: [10.1016/j.ins.2021.02.070](https://doi.org/10.1016/j.ins.2021.02.070)
2. E. Halušková, P. Mlynárčik, *On Discrete Properties of Real Functions*. Computer Algebra Systems in Teaching and Research. - Siedlce: University of Natural Sciences and Hu-manities, 2021, p. 33-44. ISBN 978-83-66541-85-6.
3. J. Pócs, J. Pócsová, *On bonds for generalized one-sided concept lattices*, Mathematics **9** (3) (2021), Art. Num. 211, 1–12. DOI: [10.3390/math9030211](https://doi.org/10.3390/math9030211)
4. M. Repický, *Spaces not distinguishing ideal convergences of real-valued functions*, Real Analysis Exchange **46** (2) (2021), 367–394. DOI: [10.14321/realanalexch.46.2.0367](https://doi.org/10.14321/realanalexch.46.2.0367)
5. M. Repický, *Spaces not distinguishing ideal convergences of real-valued functions,* II, Real Analysis Exchange **46** (2) (2021), 395–422. DOI: [10.14321/realanalexch.46.2.0395](https://doi.org/10.14321/realanalexch.46.2.0395)

**12.) Drevený píšťalový fond historických organových pozitívov na Slovensku** *(Wooden pipe configuration of historic organ positives in Slovakia)*

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| **Zodpovedný riešiteľ:** | Andrej Štafura |
| **Zodpovedný riešiteľ v organizácii SAV:** | Ján Haluška |
| **Trvanie projektu:** | 1.1.2019 / 31.12.2022 |
| **Evidenčné číslo projektu:** | 2/0106/19 |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | Ústav hudobnej vedy SAV |
| **Počet spoluriešiteľských inštitúcií:** | 6 - Slovensko: 6 |
| **Čerpané financie:** | - |

*Dosiahnuté výsledky:*   
   
1. Bola nájdená prirodzená operácia násobenia pre 12-TET ladenie, čím sa táto klasická akustická štruktúra ladenia píštalových organov stala algebrou (=dá sa tu robiť izomorfne aritmetika v hudbe). V skutočnosti existuje 11!/2 = 19 548 400 možností definovania tejto operácie.

2. Sú tu cyklické usporiadané subalgebry s počtami prvkov v cykle 12, 7, 6, 4,3, 2. Je možné nájsť inverzné prvky k lineálom v týchto subalgebrách.

**13.) Viactriedna klasifikácia rečových segmentov použitím párových klasifikátorov** *(Multiclass Speech Segments Classification Using Parallel Classifiers)*

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| **Zodpovedný riešiteľ:** | Ondrej Šuch |
| **Trvanie projektu:** | 1.1.2018 / 31.12.2021 |
| **Evidenčné číslo projektu:** | VEGA 2/0144/18 |
| **Organizácia je koordinátorom projektu:** | Áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | VEGA SAV: 1705 € |

*Dosiahnuté výsledky:*

1. R. Fabricius, O. Šuch, *Detection of vowel segments in noise with ImageNet neural network architectures*, Transportation Research Procedia **55** (2021) 1289–1295.   
   DOI: [10.1016/j.trpro.2021.07.112](https://doi.org/10.1016/j.trpro.2021.07.112)

**14.) Nové trendy v teórii agregovania a ich aplikácie**

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| **Zodpovedný riešiteľ:** | Andrea Zemánková |
| **Trvanie projektu:** | 1.1.2019 / 31.12.2022 |
| **Evidenčné číslo projektu:** | 1/0006/19 |
| **Organizácia je koordinátorom projektu:** | Nie |
| **Koordinátor:** | Stavebná fakulta STU |
| **Počet spoluriešiteľských inštitúcií:** | 2 - Slovensko: 2 |
| **Čerpané financie:** | VEGA SAV: 1942 € |

*Dosiahnuté výsledky:*

1. A. Mesiarová-Zemánková, *Characterization of n-uninorms with continuous underlying functions via z-ordinal sum construction*, International Journal of Approximate Reasoning **133** (2021), 60–79. DOI: [10.1016/j.ijar.2021.03.006](https://doi.org/10.1016/j.ijar.2021.03.006)
2. A. Mesiarová-Zemánková, *The n-uninorms with continuous underlying t-norms and t-conorms*, International Journal of General Systems **50** (1) (2021), 92-116.   
   DOI: [10.1080/03081079.2020.1863395](https://doi.org/10.1080/03081079.2020.1863395)
3. A. Mesiarová-Zemánková, *Convex combinations of uninorms and triangular subnorms*, Fuzzy Sets and Systems **423** (2021), 55–73. DOI: [10.1016/j.fss.2020.10.011](https://doi.org/10.1016/j.fss.2020.10.011)
4. A. Mesiarová-Zemánková, *Natural partial order induced by a commutative, associative and idempotent function*, Information Sciences **545** (2021) 499–512.   
   DOI: [10.1016/j.ins.2020.09.028](https://doi.org/10.1016/j.ins.2020.09.028)
5. A. Mesiarová-Zemánková, *Characterization of idempotent n-uninorms*, Fuzzy Sets and Systems **427** (2022), 1–22. DOI: [10.1016/j.fss.2020.12.019](https://doi.org/10.1016/j.fss.2020.12.019)
6. A. Mesiarová-Zemánková, R. Mesiar, Y. Su, *Ordinal sum constructions for aggregation functions on the real unit interval*, Iranian Journal of Fuzzy Systems, to appear.   
   DOI: [10.22111/IJFS.2021.6286](https://doi.org/10.22111/ijfs.2021.6286)

Zaslané na publikovanie:

1. A. Mesiarová-Zemánková, *Commutative, associative and non-decreasing functions continuous around diagonal*, Iranian Journal of Fuzzy Systems, prijaté.
2. A. Mesiarová-Zemánková, *A note on the simplification of the z-ordinal sum construction*, Fuzzy Sets and Systems, submitted (under review).
3. Y. Su, W. Zong, A. Mesiarová-Zemánková, *Constructing uninorms via ordinal sums in the sense of A. H. Clifford*, Semigroup Forum, submitted (under review).

**Programy: APVV**

**15.) Pravdepodobnostné, algebrické a kvantovo-mechanické aspekty neurčitosti** *(Probabilistic, algebraic a quantum-mechanical aspect of uncertainty)*

|  |  |
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| **Zodpovedný riešiteľ:** | Anatolij Dvurečenskij |
| **Trvanie projektu:** | 1.7.2017 / 31.12.2021 |
| **Evidenčné číslo projektu:** | APVV-16-0073 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | APVV: 12203 € |

*Dosiahnuté výsledky:*

1. N. Dilna, A. Dvurečenskij, *Michal Fečkan (on his 60th birthday)*. Nonlinear Oscillations, **24** (1) 2021, 141–144.
2. N. Dilna, A. Dvurečenskij, *Prof. RNDr. Michal Fečkan, Dr.Sc. - Sexagenarian?* Mathematica Slovaca **71** (2) (2021), 265–266. DOI: [10.1515/ms-2017-0465](https://doi.org/10.1515/ms-2017-0465)
3. A. Di Nola, A. Dvurečenskij, S. Lapenta, *An approach to stochastic processes via non-classical logic*, Ann. Pure Appl. Logic. **172** (2021), Art. Num. 103012.   
   DOI: [10.1016/j.apal.2021.103012](https://doi.org/10.1016/j.apal.2021.103012%20)
4. A. Dvurečenskij, *Doc. RNDr. Roman Frič, DrSc. passed away*, Mathematica Slovaca **71** (1) (2021), 5–10. DOI: [10.1515/ms-2017-0448](https://doi.org/10.1515/ms-2017-0448)
5. A. Dvurečenskij, O. Zahiri, A *variety containing EMV-algebras and Pierce sheaves*, Fuzzy Sets and Systems **418** (2021), 101–125. DOI: [10.1016/j.fss.2020.09.011](https://doi.org/10.1016/j.fss.2020.09.011)
6. Dvurečenskij, O. Zahiri, *Locally sigma-complete and locally complete EMV-algebras*, Soft Computing **25** (2021), 883–894. DOI: [10.1007/s00500-020-05486-3](https://doi.org/10.1007/s00500-020-05486-3%20)
7. Dvurečenskij, *Sum of n-dimensional observables on MV-effect algebras*, Soft Computing **25** (2021), 8073–8084. DOI: [10.1007/s00500-021-05911-1](https://doi.org/10.1007/s00500-021-05911-1)
8. Dvurečenskij, O. Zahiri, *Weak pseudo EMV-algebras.* I. *Basic properties*, J. Appl. Logic — IfCoLog Journal of Logics and their Applications **8** (2021), 2365–2399.
9. Dvurečenskij, O. Zahiri, *Weak pseudo EMV-algebras.* II. *Representation and subvarieties*, J. Appl. Logic — IfCoLog Journal of Logics and their Applications **8** (2021), 2401–2433.
10. R. Halaš, Z. Kurač, J. Pócs, On the minimality of some generating sets of the aggregation clone on a finite chain, Information Sciences **564** (2021), 193–201.   
    DOI: [10.1016/j.ins.2021.02.070](https://doi.org/10.1016/j.ins.2021.02.070)
11. J. Pócs, J. Pócsová, *On bonds for generalized one-sided concept lattices*, Mathematics **9** (3) (2021), Art. Num. 211, 1–12. DOI: [10.3390/math9030211](https://doi.org/10.3390/math9030211)
12. M. Girard, M. Plávala, J. Sikora, *Jordan products of quantum channels and their compatibility*, Nat Commun **12** (2021), Art. Num. 2129.

DOI: [10.1038/s41467-021-22275-0](https://doi.org/10.1038/s41467-021-22275-0)

1. G. Aubrun, L. Lami, C. Palazuelos, M. Plávala, *Entangleability of cones*, Geom. Funct. Anal. **31** (2021), 181–205. DOI: [10.1007/s00039-021-00565-5](https://doi.org/10.1007/s00039-021-00565-5)
2. Mesiarová-Zemánková, *Characterization of idempotent n-uninorms*, Fuzzy Sets and Systems **427** (2022), 1–22. DOI: [10.1016/j.fss.2020.12.019](https://doi.org/10.1016/j.fss.2020.12.019)
3. A. Mesiarová-Zemánková, *Convex combinations of uninorms and triangular subnorms*, Fuzzy Sets and Systems **423** (2021), 55–73. DOI: [10.1016/j.fss.2020.10.011](https://doi.org/10.1016/j.fss.2020.10.011)
4. A. Mesiarová-Zemánková, *The n-uninorms with continuous underlying t-norms and t-conorms*, International Journal of General Systems **50** (1) (2021), 92-116.   
   DOI: [10.1080/03081079.2020.1863395](https://doi.org/10.1080/03081079.2020.1863395)
5. A. Mesiarová-Zemánková, *Characterization of n-uninorms with continuous underlying functions via z-ordinal sum construction*, International Journal of Approximate Reasoning **133** (2021), 60–79. DOI: [10.1016/j.ijar.2021.03.006](https://doi.org/10.1016/j.ijar.2021.03.006)
6. A. Mesiarová-Zemánková, *Natural partial order induced by a commutative, associative and idempotent function*, Information Sciences **545** (2021) 499–512.   
   DOI: [10.1016/j.ins.2020.09.028](https://doi.org/10.1016/j.ins.2020.09.028)
7. A. Jenčová, *Rényi relative entropies an noncommutative Lp-spaces* II, Annales Henri Poincaré **22** (2021), 3235–3254. DOI: [10.1007/s00023-021-01074-9](https://doi.org/10.1007/s00023-021-01074-9)
8. A. Jenčová, S. Pulmannová, *Observables on synaptic algebras*, Fuzzy Sets and Systems **406** (2021), 93–106. DOI: [10.1016/j.fss.2020.05.015](https://doi.org/10.1016/j.fss.2020.05.015)
9. A. Jenčová, *A general theory of comparison of quantum channels (and beyond)*, IEEE Transactions on Information Theory **67** (2021), 3945–3964, Art. Num. 9391724.   
   DOI: [10.1109/TIT.2021.3070120](https://doi.org/10.1109/TIT.2021.3070120)
10. A. Jenčová, S. Pulmannová, *Tensor product of dimension effect algebras*, Order **38** (2021), 377–389. DOI: [10.1007/s11083-020-09546-z](https://doi.org/10.1007/s11083-020-09546-z)
11. A. Jenčová, S. Pulmannová, *Geometric and algebraic aspects of spectrality in order unit spaces: A comparison*, Journal of Mathematical Analysis and Applications **504** (2021), Art. Num. 125360. DOI: [10.1016/j.jmaa.2021.125360](https://doi.org/10.1016/j.jmaa.2021.125360)
12. S. Pulmannová, *Synaptic algebras as models for quantum mechanics*, International Journal of Theoretical Physics **60** (2021), 483–498. DOI: [10.1007/s10773-019-04045-3](https://doi.org/10.1007/s10773-019-04045-3)

**16.) Pravdepodobnostné, algebrické a kvantovo-mechanické metódy určovania neurčitosti** *(Probabilistic, Algebraic and Quantum Mechanical Methods of Uncertainty Determination)*

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Anatolij Dvurečenskij |
| **Trvanie projektu:** | 1.7.2021 / 30.6.2025 |
| **Evidenčné číslo projektu:** | APVV-20-0069 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | APVV: 11723 € |

*Dosiahnuté výsledky:*

* + 1. A. Dvurečenskij, *A short note on categorical equivalences of proper weak pseudo EMV-algebras*, J. Algebraic Hyperstructures and Logical Algebras, to appear.
    2. G. Jenča: *Orthomodular posets are algebras over bounded posets with involution, Soft Computing*, to appear. DOI: [10.1007/s00500-021-06433-6](https://doi.org/10.1007/s00500-021-06433-6)

Články zaslané na publikovanie:

1. G. Jenča, *Derived voltage graphs come from an adjunction*, Math. Slovaca
2. A. Mesiarová-Zemánková, *A note on the simplification of the z-ordinal sum construction*, Fuzzy Sets and Systems.
3. M. Papčo, *Fruits of a categorical approach to probability theory*, Acta Universitatis Matthiae Belii, series Mathematics.

**17.) Topologické štruktúry a priestory funkcií** *(Topological structures and spaces of functions)*

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Ľubica Holá |
| **Trvanie projektu:** | 1.7.2021 / 30.6.2025 |
| **Evidenčné číslo projektu:** | APVV-20-0045 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |

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| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | APVV: 5625 € |

*Dosiahnuté výsledky:*

1. Ľ. Holá, A. K. Mirmostafaee, *Joint continuity of separately continuous mappings*, Topology and its Applications **307** (2021), Art. Num. 107881.

DOI: [10.1016/j.topol.2021.107881](https://doi.org/10.1016/j.topol.2021.107881)

**18.) Topológia a geometria variet** *(Topology and Geometry of Manifolds)*

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| **Zodpovedný riešiteľ:** | Tibor Macko |
| **Trvanie projektu:** | 1.7.2017 / 30.6.2021 |
| **Evidenčné číslo projektu:** | APVV-16-0053 |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | FMFI UK, Bratislava |
| **Počet spoluriešiteľských inštitúcií:** | 1 - Slovensko: 1 |
| **Čerpané financie:** | APVV: 1250 € |

*Dosiahnuté výsledky:*

1. J. Korbaš, R. Scheidler, P. Zvengrowski, *The cup-length of stiefel and projective Stiefel manifolds*, The Graduate Journal of Mathematics **6** (2021), 27–34.

—

Pokračovali sme v práci na monografii o teórií chirurgií. Venovali sem sa korektúram a drobným vylepšeniam v kapitolách v druhej polovici knihy, najmä v tých o reťazcových komplexoch, o algebraickej teórii chirurigii, o chirurgiách na varietach nepárnych rozmerov, o topologických varietach, o aplikáciách a o modifkovaných chirurgiách. V prvej polovici roku 2022 plánujeme knihu zaslať do vydavateľstva.

Pokračovali sme hľadaní nového dôkazu hlavnej vety a totálnej chirurgickej prekážke - venovali sme sa použitiu súčinovej formuly pre homologickú časť TSO, kde sa využíva algebraická teória chirurgií v kontexte diskových komplexov. Dúfame, že v roku 2022 sa nám projekt podarí zavŕšiť.

Preprint:

1. W. Lueck, T. Macko, *Surgery theory: Foundations, book in progress with contributions by Diarmuid Crowley*, current version cca 850 pages, available online on

<http://www.mat.savba.sk/~macko/surgery-book.html>

V príprave:

1. T. Macko: *The total surgery obstruction via homotopy handle-body decompositions*.

**19.) Výnimočné štruktúry v diskrétnej matematike** *(Exceptional structures in discrete mathematics)*

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Roman Nedela |
| **Trvanie projektu:** | 1.7.2020 / 30.6.2024 |
| **Evidenčné číslo projektu:** | APVV-19-0308 |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | FMFI UK |
| **Počet spoluriešiteľských inštitúcií:** | 2 - Slovensko: 2 |
| **Čerpané financie:** | APVV: 3600 € |

*Dosiahnuté výsledky:*

1. Estélyi, J. Karabáš, R. Nedela, A. Mednykh, *On representation of the automorphism group of a graph in a unimodular group*, Discrete Mathematics **344** (2021),   
   Art. Num. 112606. DOI:[10.1016/j.disc.2021.112606](https://doi.org/10.1016/j.disc.2021.112606)

**20.) Ontologická reprezentácia pre bezpečnosť informačných systémov** *(Ontological representation for security of information systems)*

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| **Zodpovedný riešiteľ:** | Karol Nemoga |
| **Trvanie projektu:** | 1.7.2020 / 30.6.2024 |
| **Evidenčné číslo projektu:** | APVV-19-0220 |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | FEI STU Bratislava |
| **Počet spoluriešiteľských inštitúcií:** | 3 - Slovensko: 3 |
| **Čerpané financie:** | APVV: 7200 € |

*Dosiahnuté výsledky:*

1. J. R. Dora, K. Nemoga, *Clone node detection attacks and mitigation mechanisms in static wireless sensor networks*, Journal of Cybersecurity and Privacy **1** (4) (2021), 553–579. DOI: [10.3390/jcp1040028](https://doi.org/10.3390/jcp1040028)
2. J. R. Dora, K. Nemoga, *Ontology for cross-site-scripting (XSS) attack in cybersecurity*, Journal of Cybersecurity and Privacy **1** (2) (2021), 319–339.

DOI: [10.3390/jcp1020018](https://doi.org/10.3390/jcp1020018)

**21.) Vývoj inovatívnych metód pre primárnu metrológiu momentu sily aplikáciou silových účinkov konvenčnej etalonáže** *(Development of innovative methods for primary metrology torque forces by force effects of the conventional standards)*

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| **Zodpovedný riešiteľ:** | Gejza Wimmer |
| **Trvanie projektu:** | 1.7.2019 / 30.6.2022 |
| **Evidenčné číslo projektu:** | APVV-18-0066 |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | Slovenská legálna metrológia, n.o. |
| **Počet spoluriešiteľských inštitúcií:** | 4 - Slovensko: 4 |
| **Čerpané financie:** | APVV: 4439 € |

*Dosiahnuté výsledky:*

|  |
| --- |
| 1. G. Wimmer, V. Witkovský, *Determination of the exact confidence intervals for parameters in a model of direct measurements with independent random errors*, MEASUREMENT 2021 : Proceedings of the 13th International Conference on Measurement. - Bratislava : Institute of Measurement Science, SAS, 2021, 2021,  97–100. ISBN 978-80-972629-4-5.  DOI: [10.23919/Measurement52780.2021.9446786](https://doi.org/10.23919/Measurement52780.2021.9446786) |
| 1. V. Witkovský, G. Wimmer, *Exact confidence intervals for parameters in linear models with parameter constraints*, MEASUREMENT 2021 : Proceedings of the 13th International Conference on Measurement. - Bratislava : Institute of Measurement Science, SAS, 2021, 2021, p. 22–25. ISBN 978-80-972629-4-5.  DOI: [10.23919/Measurement52780.2021.9446783](https://doi.org/10.23919/Measurement52780.2021.9446783) |

**Programy: ŠPVV**

**22.) Príprava Národného programu kvantových technológií SR**

|  |  |
| --- | --- |
| **Zodpovedný riešiteľ:** | Karol Nemoga |
| **Trvanie projektu:** | 1.1.2018 / |
| **Evidenčné číslo projektu:** |  |
| **Organizácia je koordinátorom projektu:** | nie |
| **Koordinátor:** | Slovenská národná výskumná platforma kvantových technológií QUTE |
| **Počet spoluriešiteľských inštitúcií:** | 6 - Slovensko: 6 |
| **Čerpané financie:** | - |

*Dosiahnuté výsledky:*   
   
   
**Programy: Vnútroústavné**

**23.) Model pre optimalizáciu prepravy zemného plynu** *(The optimization model of natural gas transportation)*

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| **Zodpovedný riešiteľ:** | Tibor Žáčik |
| **Trvanie projektu:** | 1.1.1999 / |
| **Evidenčné číslo projektu:** | 1239 |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | - |

*Dosiahnuté výsledky:*

**Programy: Iné projekty**

**24.) Program Štipendium SAV** *(Program Fellowship of SAS)*

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| **Zodpovedný riešiteľ:** | Andrea Zemánková |
| **Trvanie projektu:** | 1.8.2013 / 31.7.2021 |
| **Evidenčné číslo projektu:** |  |
| **Organizácia je koordinátorom projektu:** | áno |
| **Koordinátor:** | Matematický ústav SAV |
| **Počet spoluriešiteľských inštitúcií:** | 0 |
| **Čerpané financie:** | SAV: 9375 € |

*Dosiahnuté výsledky:*

1. A. Mesiarová-Zemánková, *Characterization of n-uninorms with continuous underlying functions via z-ordinal sum construction*, International Journal of Approximate Reasoning **133** (2021), 60–79. DOI: [10.1016/j.ijar.2021.03.006](https://doi.org/10.1016/j.ijar.2021.03.006)
2. A. Mesiarová-Zemánková, *The n-uninorms with continuous underlying t-norms and t-conorms*, International Journal of General Systems **50** (1) (2021), 92–116.   
   DOI: [10.1080/03081079.2020.1863395](https://doi.org/10.1080/03081079.2020.1863395)
3. A. Mesiarová-Zemánková, *Convex combinations of uninorms and triangular subnorms*, Fuzzy Sets and Systems **423** (2021), 55–73. DOI: [10.1016/j.fss.2020.10.011](https://doi.org/10.1016/j.fss.2020.10.011)
4. A. Mesiarová-Zemánková, *Natural partial order induced by a commutative, associative and idempotent function*, Information Sciences **545** (2021), 499–512.   
   DOI: [10.1016/j.ins.2020.09.028](https://doi.org/10.1016/j.ins.2020.09.028)
5. A. Mesiarová-Zemánková, R. Mesiar, Y. Su, *Ordinal sum constructions for aggregation functions on the real unit interval*, Iranian Journal of Fuzzy Systems, prijaté.  
   DOI: [10.22111/IJFS.2021.6286](https://doi.org/10.22111/ijfs.2021.6286)

Zaslané na publikovanie:

1. A. Mesiarová-Zemánková, *Commutative, associative and non-decreasing functions continuous around diagonal*, Iranian Journal of Fuzzy Systems, prijaté.
2. A. Mesiarová-Zemánková, *A note on the simplification of the z-ordinal sum construction, Fuzzy Sets and Systems*, zaslané (recenzné konanie).
3. Y. Su, W. Zong, A. Mesiarová-Zemánková, *Constructing uninorms via ordinal sums in the sense of A. H. Clifford*, Semigroup Forum, zaslané (recenzné konanie).

***Príloha C***   
**Publikačná činnosť organizácie** (*generovaná z ARL*)

**AAA Vedecké monografie vydané v zahraničných vydavateľstvách**

|  |  |
| --- | --- |
| AAA01 | HOLÁ, Ľubica - HOLÝ, Dušan - MOORS, Warren. USCO and Quasicontinuous Mappings. Berlin : Walter de Gruyter, 2021. 295 p. Studies in Mathematics, 81. Dostupné na: <https://doi.org/10.1515/9783110750188-201.> ISBN 978-3-11-075015-7 |

**ACB Vysokoškolské učebnice vydané v domácich vydavateľstvách**

|  |  |
| --- | --- |
| ACB01 | PALENČÁR, R. - WIMMER, Gejza - PALENČÁR, J. - WITKOVSKÝ, Viktor. Navrhovanie a vyhodnocovanie meraní [Design and Evaluation of Measurements]. Recenzenti: M. Dovica, D. Janáčová, J. Markovič. 1. vydanie. Bratislava : Slovenská technická univerzita v Bratislave, 2021. 160 s. ISBN 978-80-227-5080-6 |

**ADCA Vedecké práce v zahraničných karentovaných časopisoch – impaktovaných**

|  |  |
| --- | --- |
| ADCA01 | AUBRUN, Guillaume - LAMI, Ludovico - PALAZUELOS, Carlos - PLÁVALA, Martin. Entangleability of Cones. In Geometric and functional analysis, 2021, vol. 31, no. 1, p. 1-25. (2020: 2.148 - IF, Q1 - JCR, 3.952 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 1016-443X. Dostupné na: <https://doi.org/10.1007/s00039-021-00565-5> |
| ADCA02 | BATTELLI, Flaviano - FEČKAN, Michal\*\*. Periodic Solutions in Slowly Varying Discontinuous Differential Equations: The Generic Case. In Mathematics, 2021, vol. 9, no. 19, art. no. 2449, p. 1-21. (2020: 2.258 - IF, Q1 - JCR, 0.495 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 2227-7390. Dostupné na: <https://doi.org/10.3390/math9192449> |
| ADCA03 | BOKES, Pavol\*\* - SINGH, Abhyudai. A modified fluctuation test for elucidating drug resistance in microbial and cancer cells. In European Journal of Control, 2021, vol. 62, p. 130-135. (2020: 2.395 - IF, Q3 - JCR, 0.884 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 0947-3580. Dostupné na: <https://doi.org/10.1016/j.ejcon.2021.06.018> |
| ADCA04 | BOKES, Pavol. Heavy-tailed distributions in a stochastic gene autoregulation model. In Journal of Statistical Mechanics-theory and experiment, 2021, vol. 2021, no. 11, art. nr. 113403. (2020: 2.231 - IF, Q2 - JCR, 0.428 - SJR, Q3 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 1742-5468. Dostupné na: <https://doi.org/10.1088/1742-5468/ac2edb> |
| ADCA05 | CAO, Xiaokai - FEČKAN, Michal - SHEN, D. - WANG, JinRong. Iterative learning control for multi-agent systems with impulsive consensus tracking. In Nonlinear Analysis : Modelling and Control, 2021, vol. 26, no. 1, p. 130-150. (2020: 3.257 - IF, Q1 - JCR, 0.734 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 1392-5113. Dostupné na: <https://doi.org/10.15388/namc.2021.26.20981> |
| ADCA06 | DANCA, Marius-F. - FEČKAN, Michal - KUZNETSOV, Nikolay - CHEN, Guanrong. Coupled Discrete Fractional-Order Logistic Maps. In Mathematics, 2021, vol. 9, issue 18, p. 1-13. (2020: 2.258 - IF, Q1 - JCR, 0.495 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 2227-7390. Dostupné na: <https://doi.org/10.3390/math9182204> |

|  |  |
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| ADCA07 | DANCA, Marius-F.\*\* - FEČKAN, Michal - KUZNETSOV, Nikolay V. - CHEN, Guanrong. Attractor as a convex combination of a set of attractors. In Communications in nonlinear science and numerical simulation, 2021, vol. 96, art. no. 105721, p. 1-11. (2020: 4.260 - IF, Q1 - JCR, 1.159 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 1007-5704. Dostupné na: <https://doi.org/10.1016/j.cnsns.2021.105721> |
| ADCA08 | DI NOLA, Antonio - DVUREČENSKIJ, Anatolij - LAPENTA, Serafina\*\*. An approach to stochastic processes via non-classical logic. In Annals of Pure and Applied Logic, 2021, vol. 172, art. no. 103012. (2020: 0.678 - IF, Q2 - JCR, 0.943 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 0168-0072. Dostupné na: <https://doi.org/10.1016/j.apal.2021.103012> |
| ADCA09 | DVUREČENSKIJ, Anatolij - ZAHIRI, Omid\*\*. A variety containing EMV-algebras and Pierce sheaves of EMV-algebras. In Fuzzy Sets and Systems, 2021, vol. 418, p. 101-125. (2020: 3.343 - IF, Q1 - JCR, 0.902 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 0165-0114. Dostupné na: <https://doi.org/10.1016/j.fss.2020.09.011> |
| ADCA10 | DVUREČENSKIJ, Anatolij. Sum of n-dimensional observables on MV-effect algebras. In Soft Computing, 2021, vol. 25, p. 8073-8084. (2020: 3.643 - IF, Q2 - JCR, 0.626 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 1432-7643. Dostupné na: <https://doi.org/10.1007/s00500-021-05911-1> |
| ADCA11 | DVUREČENSKIJ, Anatolij - ZAHIRI, Omid. Locally σ-complete and locally complete EMV-algebras. In Soft Computing, 2021, vol. 25, no. 2, p. 883-894. (2020: 3.643 - IF, Q2 - JCR, 0.626 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 1432-7643. Dostupné na: <https://doi.org/10.1007/s00500-020-05486-3> |
| ADCA12 | FEČKAN, Michal - WANG, JinRong - ZHAO, Hou Yu\*\*. Maximal and minimal nondecreasing bounded solutions of iterative functional differential equations. In Applied Mathematics Letters, 2021, vol. 113, p. 1-7. (2020: 4.055 - IF, Q1 - JCR, 1.439 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 0893-9659. Dostupné na: <https://doi.org/10.1016/j.aml.2020.106886> |
| ADCA13 | GIRARD, Mark - PLÁVALA, Martin - SIKORA, Jamie. Jordan products of quantum channels and their compatibility. In Nature Communications, 2021, vol. 12, art. no. 2129. (2020: 14.919 - IF, Q1 - JCR, 5.559 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 2041-1723. Dostupné na: <https://doi.org/10.1038/s41467-021-22275-0> |
| ADCA14 | GRAEF, John R. - JADLOVSKÁ, Irena - TUNC, Ercan. Sharp asymptotic results for third-order linear delay differential equations. In Journal of Applied Analysis and Computation, 2021, vol. 11, no. 5, p. 2459-2472. (2020: 1.827 - IF, Q2 - JCR, 0.550 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 2156-907X. Dostupné na: <https://doi.org/10.11948/20200417> |
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| ADEB03 | ČUNDERLÍKOVÁ, Katarína. Martingale convergence theorem for a conditional intuitionistic fuzzy mean value. In Notes on Intuitionistic Fuzzy Sets, 2021, vol. 27, no. 2, p. 94-102. ISSN 1310-4926. Dostupné na: <https://doi.org/10.7546/nifs.2021.27.2.94-102> |
| ADEB04 | DORA, Jean Rosemond - NEMOGA, Karol. Clone Node Detection Attacks and Mitigation Mechanisms in Static Wireless Sensor Networks. In Journal of Cybersecurity and Privacy, 2021, vol. 1, no. 4, p. 553-579. ISSN 2624-800X. Dostupné na: <https://doi.org/10.3390/jcp1040028> |
| ADEB05 | DORA, Jean Rosemond - NEMOGA, Karol. Ontology for Cross-Site-Scripting (XSS) Attack in Cybersecurity. In Journal of Cybersecurity and Privacy, 2021, vol. 1, no. 2, p. 319-339. ISSN 2624-800X. Dostupné na: <https://doi.org/10.3390/jcp1020018> |
| ADEB06 | FEČKAN, Michal\*\* - WANG, Xu - WANG, JinRong. Data-driven Analysis and Prediction of Fractional Order SIR Model for COVID-19. In Numerical Analysis and Applicable Mathematics, 2021, vol. 2, no. 3, p. 9-17. ISSN 2582-8274. Dostupné na: [https://doi.org/10.36686/Ariviyal.NAAM.2021.02.03.009](https://doi.org/10.36686/ariviyal.naam.2021.02.03.009) |
| ADEB07 | MIŠÍK, Ladislav - PORUBSKÝ, Štefan - STRAUCH, Oto. Uniform distribution of the weighted sum-of-digits functions. In Uniform Distribution Theory, 2021, vol. 16, no. 1, p. 93-126. ISSN 1336-913X. Dostupné na: <https://doi.org/10.2478/udt-2021-0005> |
| ADEB08 | POSPÍŠIL, Michal. Note on fractional difference equations with periodic and S-asymptotically periodic right-hand side. In Nonlinear Oscillations, 2021, vol. 24, no. 1, art. no. 1339, p. 99-109. ISSN 1562-3076. |
| ADEB09 | REPICKÝ, Miroslav. Spaces not distinguishing ideal convergences of real-valued functions. In Real Analysis Exchange, 2021, vol. 46, no. 2, p. 367-394. (2020: 0.229 - SJR, Q4 - SJR). ISSN 0147-1937. Dostupné na: <https://doi.org/10.14321/realanalexch.46.2.0367> |
| ADEB10 | REPICKÝ, Miroslav. Spaces not distinguishing ideal convergences of real-valued functions, II. In Real Analysis Exchange, 2021, vol. 46, no. 2, p. 395-422. (2020: 0.229 - SJR, Q4 - SJR). ISSN 0147-1937. Dostupné na: <https://doi.org/10.14321/realanalexch.46.2.0395> |
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**ADFB Vedecké práce v ostatných domácich časopisoch – neimpaktovaných**

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| ADFB02 | PELEGRINOVÁ, Kateřina - MAČUTEK, Ján - ČECH, Radek. The Menzerath-Altmann law as the relation between lengths of words and morphemes in Czech. In Jazykovedný časopis, 2021, roč. 72, č. 2, s. 405-414. (2020: 0.186 - SJR, Q2 - SJR). (2021 - SCOPUS). ISSN 0021-5597. Dostupné na: <https://doi.org/10.2478/jazcas-2021-0037> |

**ADMA Vedecké práce v zahraničných impaktovaných časopisoch registrovaných v databázach Web of Science alebo SCOPUS**

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| ADMA03 | ESTÉLYI, István - KARABÁŠ, Ján - NEDELA, Roman - MEDNYKH, Alexander. On a representation of the automorphism group of a graph in a unimodular group. In Discrete Mathematics, 2021, vol. 344, art. nr. 112606. (2020: 0.870 - IF, Q3 - JCR, 0.785 - SJR, Q1 - SJR). ISSN 0012-365X. Dostupné na: <https://doi.org/10.1016/j.disc.2021.112606> |
| ADMA04 | HOLÁ, Ľubica - HOLÝ, Dušan. Quasicontinuous functions and the topology of pointwise convergence. In Topology and its Applications, 2020, vol. 282, art. no. 107301. (2019: 0.531 - IF, Q4 - JCR, 0.594 - SJR, Q3 - SJR). ISSN 0166-8641. Dostupné na: <https://doi.org/10.1016/j.topol.2020.107301> |
| ADMA05 | JENČOVÁ, Anna - PULMANNOVÁ, Sylvia. Tensor Product of Dimension Effect Algebras. In Order : a Journal on the Theory of Ordered Sets and its Applications, 2021, vol. 38, p. 377-389. (2020: 0.616 - IF, Q4 - JCR, 0.465 - SJR, Q3 - SJR). ISSN 0167-8094. Dostupné na: <https://doi.org/10.1007/s11083-020-09546-z> |
| ADMA06 | MIAO, Fahe - FEČKAN, Michal - WANG, JinRong\*\*. A new approach to study constant vorticity water flows in the β-plane approximation with centripetal forces. In Dynamics of Partial Differential Equations, 2021, vol. 18, no. 3, p. 199-210. (2020: 0.968 - IF, Q3 - JCR, 1.045 - SJR, Q1 - SJR). ISSN 1548-159X. Dostupné na: [https://doi.org/10.4310/DPDE.2021.v18.n3.a2](https://doi.org/10.4310/dpde.2021.v18.n3.a2) |
| ADMA07 | SEEMAB, Arjumand - REHMAN, Mujeeb ur - FEČKAN, Michal - ALZABUT, Jehad - ABBAS, Syed. On the Existence and Ulam–Hyers Stability of a New Class of (ϕ, χ)-Fractional Differential Equations With Impulses. In Filomat, 2021, vol. 35, no. 6, p. 1977-1991. (2020: 0.844 - IF, Q3 - JCR, 0.449 - SJR, Q2 - SJR). ISSN 0354-5180. Dostupné na: [https://doi.org/10.2298/FIL2106977S](https://doi.org/10.2298/fil2106977s) |

**ADMB Vedecké práce v zahraničných neimpaktovaných časopisoch registrovaných v databázach Web of Science alebo SCOPUS**

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| ADMB02 | CELIK, Candan - BOKES, Pavol - SINGH, Abhyudai. Protein Noise and Distribution in a Two-Stage Gene-Expression Model Extended by an mRNA Inactivation Loop. In Computational Methods in Systems Biology : Proceedings LNCS 12881. - Springer International Publishing, 2021, 2021, p. 215-229. (2020: 0.249 - SJR, Q3 - SJR). ISBN 978-3-030-85632-8. Dostupné na: <https://doi.org/10.1007/978-3-030-85633-5_13> |
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| ADMB10 | KUBÁT, Miroslav - NETOLICKÁ, Šárka - ČECH, Radek - MAČUTEK, Ján. Martin of Cochem´s Golden Key of Heaven and its Czech Relatives: Quantitative Analysis of Baroque Prayers. In Bohemistyka, 2021, vol. 3, p. 283-294. (2020: 0.110 - SJR, Q3 - SJR). ISSN 1642-9893. Dostupné na: <https://doi.org/10.14746/bo.2021.3.1> |
| ADMB11 | MICHALÍKOVÁ, Alžbeta\*\* - RIEČAN, Beloslav. On States on Fuzzy MV-algebra. In Advances in Intelligent Systems and Computing.Uncertainty and Imprecision in Decision Making and Decision Support: New Challenges, Solutions and Perspectives. - Cham : Springer, 2021, 2021, vol. 1081, p. 40-46. ISBN 978-3-030-47023-4. ISSN 2194-5357. Dostupné na: <https://doi.org/10.1007/978-3-030-47024-1_5> |

**ADNA Vedecké práce v domácich impaktovaných časopisoch registrovaných v databázach Web of Science alebo SCOPUS**

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| ADNA01 | KAŇUCHOVÁ, Mária - ORAVCOVÁ, Andrea - SISOL, Martin - KOŠČOVÁ, Michaela - KOZÁKOVÁ, Ľubica. Leaching of gold from flotation waste by thiourea. In Acta Montanistica Slovaca, 2021, vol. 26, no. 1, p. 98-105. (2020: 1.413 - IF, Q3 - JCR, 0.472 - SJR, Q2 - SJR). ISSN 1335-1788. Dostupné na: [https://doi.org/10.46544/AMS.v26i1.08](https://doi.org/10.46544/ams.v26i1.08) |

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| AECA01 | ČECH, Radek - KOSEK, Pavel - NAVRÁTILOVÁ, Olga - MAČUTEK, Ján. On the impact of the initial phrase length on the position of enclitics in Old Czech. In Language and Text: Data, models, information and applications. - Amsterdam : John Benjamin Publishing Company, 2021, p. 9-20. ISBN 978-90-272-1010-4. Dostupné na: <https://doi.org/10.1075/cilt.356/01cec> |
| AECA02 | ČECH, Radek - MAČUTEK, Ján. The Menzerath-Altmann Law in Czech Poems by K. J. Erben. In Tackling the Toolkit : Plotting Poetry through Computational Literary Studies. - Prague, Czech Republic : Institute of Czech Literature of the Czech Academy of Sciences, 2021, p. 5-14. ISBN 978-80-7658-032-9. Dostupné na: [https://doi.org/10.51305/ICL.CZ.9788076580336.01](https://doi.org/10.51305/icl.cz.9788076580336.01) |
| AECA03 | HALUŠKOVÁ, Emília - MLYNÁRČIK, Peter. On Discrete Properties of Real Functions. In Computer Algebra Systems in Teaching and Research. - Siedlce : University of Natural Sciences and Humanities, 2021, 2021, p. 33-44. ISBN 978-83-66541-85-6. |
| AECA04 | MAČUTEK, Ján - ČECH, Radek - COURTIN, Marine. The Menzerath-Altmann law in syntactic structure revisited: Combining linearity of language with dependency syntax. In Second Workshop on Quantitative Syntax.Proceedings. - Stroudsburg, USA : The Association for Computational Linguistics, p. 65-73. ISBN 978-1-955917-15-5. |
| AECA05 | RUJEVIC, Biljana - KAPLAR, Marija - KAPLAR, Sebastijan - STANKOVIC, Ranka - OBRADOVIC, Ivan - MAČUTEK, Ján. Quantitative analysis of syllable properties in Croatian, Serbian, Russian, and Ukrainian. In Language and Text: Data, models, information and applications. - Amsterdam : John Benjamin Publishing Company, 2021, p. 55-67. ISBN 978-90-272-1010-4. Dostupné na: <https://doi.org/10.1075/cilt.356.04ruj> |

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| AEDA01 | WIMMER, Gejza - WITKOVSKÝ, Viktor - ŽÁKOVÁ MYŠKOVÁ, K. Two-dimensional linear comparative calibration. In Perspectives in Measurement, Modeling and Interpretation. - Bratislava, Slovakia : Vysoká škola manažmentu/City University of Seattle programs, 2020, p. 15-37. ISBN 978-80-89306-54-1. |

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| AFG01 | KUZNETSOV, E. D. - VASILEVA, M. A. - ROSAEV, A. - PLÁVALOVÁ, Eva. Some examples of close asteroid pairs interactions with resonances. In LPI Contribution, no. 2609. ISSN 0161-5297. |

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| GHG01 | KOŠČ, Ivan - KOŠČOVÁ, Michaela - ODLER, Robert. Perspectives of quantitative-linguistics methods in police psychoanalysis. In FEATURE, SUPERIOR, LAW Theses of additional participants international scientific and practical conference, dedicated to the memory of Professor S.P. Bocharovo, 2021, 236 p. Dostupné na internete: [http://dspace.lvduvs.edu.ua/bitstream/1234567890/3846/1/%D0%9A%D1%83%D1%86%D0%B8%D0%B9%20%D1%82%D0%B5%D0%B7%D0%B8%2015.04.21%20%D0%BA%D0%BE%D0%BD%D1%84%D0%B5%D1%80%D0%B5%D0%BD%D1%86%D1%96%D1%8F%20%D1%85%D0%B0%D1%80%D0%BA%D1%96%D0%B2%20%D0%BA%D0%BE%D1%80%D0%BF%D0%BE%D1%80.%D0%BA%D1%83%D0%BB%D1%8C%D1%82%20%D0%B2%20%D0%BC%D0%B2%D1%81.pdf](http://dspace.lvduvs.edu.ua/bitstream/1234567890/3846/1/ĐšŃŃ†Đ¸Đą%20Ń‚ĐµĐ·Đ¸%2015.04.21%20ĐşĐľĐ˝Ń) |
| GHG02 | KOŠČ, Ivan - KOŠČOVÁ, Michaela - ODLEROVÁ, Miriam - ODLER, Robert. Changes in the education process reflecting the crisis. In Kharkiv National University of Internal Affairs: 20 years in the status of national. Proceedings of international scientific and practical conference, 2021, 472 p. Dostupné na internete: [http://dspace.univd.edu.ua/xmlui/bitstream/handle/123456789/10218/KhNUVS\_20%20rokiv%20u%20statusi%20natsionalnoho\_2021.pdf?sequence=1&isAllowed=y](http://dspace.univd.edu.ua/xmlui/bitstream/handle/123456789/10218/khnuvs_20%20rokiv%20u%20statusi%20natsionalnoho_2021.pdf?sequence=1&isallowed=y) |
| GHG03 | OKŠA, Gabriel - YAMAMOTO, Yusaku - VAJTERŠIC, Marián. On convergence to singular triplets in the two-sided block-Jacobi SVD algorithm with dynamic ordering: Part II : Technical report 2021-01 [elektronický zdroj]. Salzburg, Austria : University of Salzburg, Department of Computer Sciences, 2021. 10 p. Názov z internetu. Požaduje sa Adobe Reader. Dostupné na internete: [https://www.plus.ac.at/wp-content/uploads/2021/04/2021-01\_Oksa\_Yamamoto\_Vajtersic.pdf](https://www.plus.ac.at/wp-content/uploads/2021/04/2021-01_oksa_yamamoto_vajtersic.pdf) |

**GII Rôzne publikácie a dokumenty, ktoré nemožno zaradiť do žiadnej z predchádzajúcich kategórií**

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| GII05 | DVUREČENSKIJ, Anatolij - VOLAUFOVÁ, J. - WIMMER, Gejza - WITKOVSKÝ, Viktor. Prof. RNDr. Ing. Lubomír Kubáček, DrSc., Dr.h.c. – Nonagenarian. In Mathematica Slovaca, 2021, vol. 71, no. 1, p. 1-4. (2020: 0.770 - IF, Q3 - JCR, 0.445 - SJR, Q2 - SJR). ISSN 0139-9918. Dostupné na: <https://doi.org/10.1515/ms-2017-0447> |
| GII06 | DVUREČENSKIJ, Anatolij. Doc. RNDr. Roman Frič, DrSc. passed away. In Mathematica Slovaca, 2021, vol. 71, no. 1, p. 5-10. (2020: 0.770 - IF, Q3 - JCR, 0.445 - SJR, Q2 - SJR). ISSN 0139-9918. Dostupné na: <https://doi.org/10.1515/ms-2017-0448> |
| GII07 | JIRÁSKOVÁ, Galina - CÂMPEANU, Cezar. Special Issue on Implementation and Application of Automata : Preface. In Theoretical Computer Science, 2021, vol. 870, p. 1-2. (2020: 0.827 - IF, Q4 - JCR, 0.464 - SJR, Q2 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 0304-3975. Dostupné na: <https://doi.org/10.1016/j.tcs.2021.05.001> |

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| AAA01 | BOSÁK, Juraj. Decompositions of Graphs. Dordrecht : Kluwer Academic Publishers, 1990. 272 s. ISBN 978-0-7923-0747-1 |

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*1. [1.1] LEE, Hung-Chih - CHEN, Zhen-Chun. DECOMPOSING THE COMPLETE GRAPH INTO HAMILTONIAN PATHS (CYCLES) AND 3-STARS. In DISCUSSIONES MATHEMATICAE GRAPH THEORY. ISSN 1234-3099, 2020, vol. 40, no. 3, p. 823-839., Registrované v: WOS*

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| AAA02 | DVUREČENSKIJ, Anatolij. Gleason´s Theorem and Its Applications. Dordrecht : Kluwer Academic Publishers, 1993. 325+xv pp. ISBN 978-0-7923-1990-0 |

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| AAA03 | DVUREČENSKIJ, Anatolij - PULMANNOVÁ, Sylvia. New Trends in Quantum Structures. Dordrecht : Kluwer Academic ; Bratislava : Ister Science, 2000. 541+xvi pp. ISBN 0-7923-6471-6 |

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**AFC Publikované príspevky na zahraničných vedeckých konferenciách**

|  |  |
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| AFC01 | BUTKA, P. - PÓCSOVÁ, J. - PÓCS, Jozef. Experimental Study on Time Complexity of GOSCL Algorithm for Sparse Data Tables. In SACI 2012: 7th IEEE International Symposium on Applied Computational Intelligence and Informatics: proceedings: Timişoara, Romania, May 24-26, 2012. - Piscataway : IEEE, 2012, p. 101-106. ISBN 978-1-4673-1011-6. |

Citácie:

*1. [1.1] YANG, Sichun - LU, Yunan - JIA, Xiuyi - LI, Weiwei. Constructing three-way concept lattice based on the composite of classical lattices. In INTERNATIONAL JOURNAL OF APPROXIMATE REASONING. ISSN 0888-613X, 2020, vol. 121, p. 174-186., Registrované v: WOS*

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| AFC02 | FLATZ, Markus - KUTIL, Rade - VAJTERŠIC, Marián\*. Parallelization of the hierarchical alternating least squares algorithm for Nonnegative Matrix Factorization. In 4th International Forum on Research and Technologies for Society and Industry (IEEE RTSI 2018) : forum proceedings. - Piscataway : IEEE, 2018, p. 208-212. ISBN 978-1-5386-6282-3. |

Citácie:

*1. [1.2] SAO, Piyush - KANNAN, Ramakrishnan. Multifrontal non-negative matrix factorization. In Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). ISSN 03029743, 2020-01-01, 12043 LNCS, p. 543-554., Registrované v: SCOPUS*

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| AFC03 | RIEČAN, Beloslav. On the probability and random variables on if events. In Proceedings of the 7th international flins conference. - Genova, 2006, 2006, p. 138-145. Dostupné na: <https://doi.org/10.1142/9789812774118_0023> |

Citácie:

*1. [1.1] CUNDERLIKOVA, K. Individual ergodic theorem for intuitionistic fuzzy observables using intuitionistic fuzzy state. In IRANIAN JOURNAL OF FUZZY SYSTEMS. ISSN 1735-0654, 2020, vol. 17, no. 5, p. 13-22., Registrované v: WOS*

*2. [1.1] CUNDERLIKOVA, K. Product operation and joint interval valued observable. In IRANIAN JOURNAL OF FUZZY SYSTEMS. ISSN 1735-0654, 2020, vol. 17, no. 4, p. 1-6., Registrované v: WOS*

*3. [1.1] CUNDERLIKOVA, Katarina. Martingale Convergence Theorem for the Conditional Intuitionistic Fuzzy Probability. In MATHEMATICS, 2020, vol. 8, no. 10., Registrované v: WOS*

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| --- | --- |
| AFC04 | VOJTÁŠ, Peter. Generalized Galois-Tukey connections between explicit relations on classical objects of real analysis. In Set Theory of the Reals, Vol. 6. - Bar-Ilan University, 1993, s. 619-643. |

Citácie:

*1. [1.2] GOLDSTERN, Martin - KELLNER, Jakob - MEJÍA, Diego A. - SHELAH, Saharon. Controlling cardinal characteristics without adding reals. In Journal of Mathematical Logic. ISSN 02190613, 2020-01-01., Registrované v: SCOPUS*

|  |  |
| --- | --- |
| AFC05 | ŽÁČIK, Tibor - MRAČKA, Igor - HAJOSSY, Rudolf - HYČKO, Marek. Reinforcement Learning in Gas Transport Control. In PSIG 2018, Pipeline Simulation Interest Group, Annual Meeting 15-18 May, 2018, Utah, USA. - Utah, 2018 : Pipeline Simulation Interest Group. |

Citácie:

*1. [1.2] BANSAL, Surbhi - SAADALLAH, Nejm - SELVIK, Jon T. - ABRAHAMSEN, Eirik B. Development of a bivariate machine-learning approach for decision-support in offshore drilling operations. In Proceedings of the 30th European Safety and Reliability Conference and the 15th Probabilistic Safety Assessment and Management Conference, 2020-01-01, p. 2742-2749., Registrované v: SCOPUS*

*2. [1.2] MOHAMED-ILIASSE, Mahraz - LOUBNA, Benabbou - ABDELAZIZ, Berrado. Is machine learning revolutionizing supply chain? In Proceedings 2020 5th International Conference on Logistics Operations Management, GOL 2020, 2020-10-28, art. nr. 9314713., Registrované v: SCOPUS*

**AFD Publikované príspevky na domácich vedeckých konferenciách**

|  |  |
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| AFD01 | KOREC, Ivan - WIEDERMANN, Jiří. Deterministic verification of integer matrix multiplication in quadratic time. In SOFSEM 2014: theory and practice of computer science : proceedings, LNCS 8327. V. Geffert, B. Preneel, B. Rovan, J. Štuller, A.M. Tjoa (eds.). - Cham : Springer, 2014, s. 375-382. ISBN 978-3-319-04297-8. ISSN 0302-9743. (SOFSEM 2014) |

Citácie:

*1. [1.1] JI, Hao - MASCAGNI, Michael - LI, Yaohang. Gaussian variant of Freivalds'; algorithm for efficient and reliable matrix product verification. In MONTE CARLO METHODS AND APPLICATIONS. ISSN 0929-9629, 2020, vol. 26, no. 4, p. 273-284., Registrované v: WOS*

*2. [1.1] LINGAS, Andrzej - PERSSON, Mia. Computing the Boolean Product of Two n x n Boolean Matrices Using O(n(2)) Mechanical Operations. In INTERNATIONAL JOURNAL OF UNCONVENTIONAL COMPUTING. ISSN 1548-7199, 2020, vol. 15, no. 3, p. 225-236., Registrované v: WOS*

**\*AFDA Publikované príspevky na medzinárodných vedeckých konferenciách poriadaných v SR**

|  |  |
| --- | --- |
| AFDA01 | JIRÁSKOVÁ, Galina - PALMOVSKÝ, Matús. Kleene Closure and State Complexity. In ITAT 2013, CEUR Workshop proceedings, 2013, s. 94-100. |

Citácie:

*1. [1.1] ALMONACID SIERRRA, Juan Jorge - CORONEL AVILA, Yeisson. Application of Artificial Intelligence and Blockchain in Contract Law. In REVISTA DE DERECHO PRIVADO. ISSN 0123-4366, 2020, vol., no. 38, p. 119-142., Registrované v: WOS*

**AGI Správy o vyriešených vedeckovýskumných úlohách**

|  |  |
| --- | --- |
| AGI01 | DVUREČENSKIJ, Anatolij - KULJUKINA, L. A. - OSOSKOV, G. A. Ob ocenke plotnosti sledov v trekovych kamerach. In OIJaI, 1981, č. 5-81-362, s. 1-14. |

Citácie:

*1. [1.2] LEBEDEV, E. O. - LIVINSKA, G. V. On the asymptotic merging of the set of nodes in stochastic networks. In Theory of Probability and Mathematical Statistics. ISSN 00949000, 2020-01-01, 101, p. 167-177., Registrované v: SCOPUS*

**GHG Práce zverejnené spôsobom umožňujúcim hromadný prístup**

|  |  |
| --- | --- |
| GHG01 | GRENDÁR, Marián - JUDGE, G.G. Revised empirical likelihood. In CUDARE Working Paper No. 1106. - Berkeley, CA : University of California, 2010. Dostupné na internete: <http://escholarship.org/uc/item/6gs579r0> |

Citácie:

*1. [1.1] JAEGER, A. - LAZAR, N.A. Split sample empirical likelihood. In COMPUTATIONAL STATISTICS & DATA ANALYSIS. ISSN 0167-9473, 2020, vol. 150., Registrované v: WOS*

***Príloha D***

**Údaje o pedagogickej činnosti organizácie**

Semestrálne prednášky:

Mgr. Martin Bečka, PhD.

Názov semestr. predmetu: Analýza a zložitosť algoritmov

Počet hodín za semester: 204

Názov katedry a vysokej školy: Fakulta informatiky a informačných technológií STU, UISI

Mgr. Martin Bečka, PhD.

Názov semestr. predmetu: Analýza a zložitosť algoritmov

Počet hodín za semester: 48

Názov katedry a vysokej školy: Fakulta informatiky a informačných technológií STU, UISI

RNDr. Katarína Čunderlíková, PhD.

Názov semestr. predmetu: Analytická geometria 1

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Mateja Bela v Banskej Bystrici, Katedra matematiky

RNDr. Katarína Čunderlíková, PhD.

Názov semestr. predmetu: Analytická geometria 3

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Mateja Bela v Banskej Bystrici, Katedra matematiky

prof. RNDr. Michal Fečkan, DrSc.

Názov semestr. predmetu: Funkcionálna analýza 1

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Komenského v Bratislave, Katedra matematickej analýzy a numerickej matematiky

prof. RNDr. Michal Fečkan, DrSc.

Názov semestr. predmetu: Funkcionálna analýza 2

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Komenského, Botanická záhrada, Katedra matematickej analýzy a numerickej matematiky

prof. RNDr. Michal Fečkan, DrSc.

Názov semestr. predmetu: Nelineárna funkcionálna analýza

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Komenského v Bratislave, Katedra matematickej analýzy a numerickej matematiky

RNDr. Emília Halušková, CSc.

Názov semestr. predmetu: Teoretická aritmetika

Počet hodín za semester: 20

Názov katedry a vysokej školy: Fakulta humanitných a prírodných vied PU, Katedra fyziky, matematiky a techniky

RNDr. Emília Halušková, CSc.

Názov semestr. predmetu: Teoretická aritmetika

Počet hodín za semester: 14

Názov katedry a vysokej školy: Fakulta humanitných a prírodných vied PU, Katedra fyziky, matematiky a techniky

doc. Mgr. Tibor Macko, PhD.

Názov semestr. predmetu: Algebraická topológia

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KAG

doc. Mgr. Tibor Macko, PhD.

Názov semestr. predmetu: Diferenciálna topológia

Počet hodín za semester: 24

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KAG

doc. Mgr. Tibor Macko, PhD.

Názov semestr. predmetu: Lineárna algebra a geometria 1

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KAG

doc. Mgr. Tibor Macko, PhD.

Názov semestr. predmetu: Lineárna algebra a geometria 2

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KAG

doc. Mgr. Tibor Macko, PhD.

Názov semestr. predmetu: Teória kategórií 2

Počet hodín za semester: 20

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KAG

doc. RNDr. Karol Nemoga, CSc.

Názov semestr. predmetu: Logika

Počet hodín za semester: 26

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Ústav aplikovanej informatiky a matematiky

doc. RNDr. Karol Nemoga, CSc.

Názov semestr. predmetu: Rýchle algoritmy

Počet hodín za semester: 26

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Ústav aplikovanej informatiky a matematiky

Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 1

Počet hodín za semester: 24

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu

Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 1

Počet hodín za semester: 8

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu   
Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 2

Počet hodín za semester: 8

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu

Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 2

Počet hodín za semester: 24

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu

doc. Ing. Gabriel Okša, CSc.

Názov semestr. predmetu: MATLAB

Počet hodín za semester: 26

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Stavebná fakulta

doc. Ing. Gabriel Okša, CSc.

Názov semestr. predmetu: Numerické metódy lineárnej algebry

Počet hodín za semester: 39

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Stavebná fakulta

RNDr. Jozef Pócs, PhD.

Názov semestr. predmetu: Logika a teorie množin / cvičenia / prednášky

Počet hodín za semester: 39

Názov katedry a vysokej školy: Přírodovědecká fakulta Univerzity Palackého, Olomouc, Česká republika , Katedra algebry a geometrie

RNDr. Jozef Pócs, PhD.

Názov semestr. predmetu: Teorie grafů / cvičenia / prednášky

Počet hodín za semester: 39

Názov katedry a vysokej školy: Přírodovědecká fakulta Univerzity Palackého, Olomouc, Česká republika , Katedra algebry a geometrie

RNDr. Michal Pospíšil, PhD.

Názov semestr. predmetu: Matematická analýza (4)

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KMANM

RNDr. Michal Pospíšil, PhD.

Názov semestr. predmetu: Matematika pre chémiu

Počet hodín za semester: 65

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KMANM

prof. RNDr. Marian Vajteršic, DrSc.

Názov semestr. predmetu: Lineare Algebra

Počet hodín za semester: 45

Názov katedry a vysokej školy: Universitaet Salzburg, Austria, Fachbereich Computerwissenschaften

prof. RNDr. Marian Vajteršic, DrSc.

Názov semestr. predmetu: Rechnerarchitektur

Počet hodín za semester: 30

Názov katedry a vysokej školy: Universitaet Salzburg, Austria, Fachbereich Computerwissenschaften   
Semestrálne cvičenia:

RNDr. Katarína Čunderlíková, PhD.

Názov semestr. predmetu: Analytická geometria 1

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Mateja Bela v Banskej Bystrici, Katedra matematiky

RNDr. Katarína Čunderlíková, PhD.

Názov semestr. predmetu: Analytická geometria 3

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Mateja Bela v Banskej Bystrici, Katedra matematiky

Mgr. Marek Hyčko, PhD.

Názov semestr. predmetu: Analýza a zložitosť algoritmov

Počet hodín za semester: 72

Názov katedry a vysokej školy: Fakulta informatiky a informačných technológií STU, Ústav informatiky, informačných systémov a softvérového inžinierstva

doc. RNDr. Karol Nemoga, CSc.

Názov semestr. predmetu: Logika

Počet hodín za semester: 26

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Ústav aplikovanej informatiky a matematiky

doc. RNDr. Karol Nemoga, CSc.

Názov semestr. predmetu: Rýchle algoritmy

Počet hodín za semester: 26

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Ústav aplikovanej informatiky a matematiky

Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 1

Počet hodín za semester: 8

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu

Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 1

Počet hodín za semester: 24

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu

Mgr. Branislav Novotný, PhD.

Názov semestr. predmetu: Štatistika 2

Počet hodín za semester: 8

Názov katedry a vysokej školy: Katolícka univerzita v Ružomberku, Katedra manažmentu

Mgr. Viktor Olejár

Názov semestr. predmetu: Klasické a kvantové výpočty

Počet hodín za semester: 26

Názov katedry a vysokej školy: Prírodovedecká fakulta UPJŠ, Ústav informatiky

RNDr. Michal Pospíšil, PhD.

Názov semestr. predmetu: Matematická analýza (4)

Počet hodín za semester: 26

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KMANM

RNDr. Michal Pospíšil, PhD.

Názov semestr. predmetu: Matematika (3)

Počet hodín za semester: 39

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KMANM

RNDr. Michal Pospíšil, PhD.

Názov semestr. predmetu: Matematika (4)

Počet hodín za semester: 26

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, KMANM

Ing. Peter Sýs

Názov semestr. predmetu: Operačné systémy

Počet hodín za semester: 48

Názov katedry a vysokej školy: Fakulta informatiky a informačných technológií STU, Ústav počítačového inžinierstva a aplikovanej informatiky

Semináre:

Terénne cvičenia:

Individuálne prednášky:   
   
 ***Príloha E***

**Medzinárodná mobilita organizácie**

**(A) Vyslanie vedeckých pracovníkov do zahraničia na základe dohôd:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Krajina** | **D r u h d o h o d y** | | | | | |
|  | **MAD, KD, VTS** | | **Medziústavná** | | **Ostatné** | |
|  | **Meno pracovníka** | **Počet dní** | **Meno pracovníka** | **Počet dní** | **Meno pracovníka** | **Počet dní** |
| Česko |  |  |  |  | Anna Jenčová | 1 |
|  |  |  |  |  | Ján Mačutek | 8 |
|  |  |  |  |  | Karol Nemoga | 2 |
|  |  |  |  |  | Jozef Pócs | 2 |
| Grécko |  |  |  |  | Ján Mačutek | 6 |
| **Počet vyslaní spolu** |  |  |  |  | **5** | **19** |

**(B) Prijatie vedeckých pracovníkov zo zahraničia na základe dohôd:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Krajina** | **D r u h d o h o d y** | | | | | |
|  | **MAD, KD, VTS** | | **Medziústavná** | | **Ostatné** | |
|  | **Meno pracovníka** | **Počet dní** | **Meno pracovníka** | **Počet dní** | **Meno pracovníka** | **Počet dní** |
| Česko |  |  |  |  | Kateřina Pelegrinová | 3 |
|  |  |  |  |  | Michaela Nogolová | 3 |
|  |  |  |  |  | Miroslav Kubát | 3 |
|  |  |  |  |  | Radek Čech | 3 |
| **Počet prijatí spolu** |  |  |  |  | **4** | **12** |

**(C) Účasť pracovníkov pracoviska na konferenciách v zahraničí (nezahrnutých v "A"):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Krajina** | **Názov konferencie** | **Meno pracovníka** | **Počet dní** |
| Austrália (online) | The 4th Australian Algebra Conference | Miroslav Haviar | 2 |
| Bulharsko (online) | ER&D 2021 | Branislav Novotný | 4 |
| Česko | BiblCZ2021 | Ján Mačutek | 1 |
|  | SLSW | Michaela Koščová | 4 |
|  |  | Ján Mačutek | 5 |
| Čile (online) | SPC 2021 | Eva Plávalová | 4 |
| Japonsko (online) | QUALICO 2021 | Ján Mačutek | 3 |
| Malta | Toward21 | Karol Nemoga | 5 |
| Poľsko (online) | AAA 100 | Emília Halušková | 3 |
|  |  | Miroslav Haviar | 3 |
|  | ISCORFT 2021 | Anatolij Dvurečenskij | 2 |
|  | QPL 2021 | Anna Jenčová | 5 |
| Portugalsko (online) | DLT 2021 | Michal Hospodár | 5 |
|  |  | Peter Mlynárčik | 5 |
| Rumunsko (online) | IAU\_S364 | Eva Plávalová | 5 |
| Srbsko (online) | AAA 101 | Emília Halušková | 3 |
| Španielsko (online) | PLATO | Eva Plávalová | 5 |
| Turecko (online) | Opalg2021 | Anna Jenčová | 3 |
| Ukrajina (online) | Modern21 | Natália Dilna | 1 |
| USA (online) | BLAST 2021 | Anatolij Dvurečenskij | 5 |
|  |  | Miroslav Haviar | 5 |
|  | TRENDY3 | Eva Plávalová | 4 |
|  | TSC 2021 | Eva Plávalová | 5 |
| **Spolu** | **19** | **23** | **87** |

*Vysvetlivky: MAD - medziakademické dohody, KD - kultúrne dohody, VTS - vedecko-technická spolupráca v rámci vládnych dohôd*

Skratky použité v tabuľke C:

AAA 100 - Arbeitstagung Allgemeine Algebra 100

AAA 101 - Arbeitstagung Allgemeine Algebra 101

BiblCZ2021 - Biblický jazyk v západoslovanských překladech – podoby a proměny

BLAST 2021 - Boolean Algebras, Lattices, Universal Algebra, Set Theory, Topology 2021

DLT 2021 - The 25th International Conference on Developments in Language Theory

ER&D 2021 - 13th International Conference Education, Research and Development

IAU\_S364 - Multi-scale (time and mass) dynamics of space objects

ISCORFT 2021 - 35th International Summer Conference on Real Functions Theory

Modern21 - International online conference Modern information technology and innovation methods in teaching: experience, trends, and prospects

Opalg2021 - Conference in Operator Algebras and Related Topics

PLATO - PLATO Mission Conference 2021

QPL 2021 - 18th International Conference on Quantum Physics and Logic

QUALICO 2021 - The first international conference of quantitative linguistics in Asia

SLSW - II. Summer Workshop for Statistics in Linguistics

SPC 2021 - The Star-Planet Connection - Virtual Workshop

The 4th Australian Algebra Conference - AAC04

Toward21 - Toward a quantum-safe communication infrastructure (NATO Advanced Research Workshop on Quantum & Post-quantum Cryptography)

TRENDY3 - TRiple EvolutioN and DYnamics 3

TSC 2021 - TESS Science Conference II

***Príloha F***

**Vedecko-popularizačná činnosť pracovníkov organizácie SAV**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Meno** | **Spoluautori** | **Typ1** | **Názov** | **Miesto zverejnenia** | **Dátum alebo počet za rok** |
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*1 PB - prednáška/beseda, TL - tlač, TV - televízia, RO - rozhlas, IN - internet, EX - exkurzia, PU - publikácia, MM - multimédiá, DO - dokumentárny film*