Decomposition of effect algebras and the Hammer-Sobczyk theorem

Giuseppina Barbieri

Department of Mathematics and Computer Science
Via delle Scienze 206, 33100 Udine, Italy
E-mail: `barbieri@dimi.uniud.it`

Abstract

A measure μ on an algebra $\mathscr{A}$ of subsets of a set X is said to be continuous if for any positive number ε there is a partition $X = \bigcup_{i=1}^{n} X_i$ of X with $X_i \in \mathscr{A}$ and $\mu(X_i) < \varepsilon$. In 1944 Sobczyk and Hammer proved that every nonnegative finitely additive measure μ can be expressed as the sum $\mu_0 + \sum \mu_i$, at most denumerable, of additive functions such that μ_0 is continuous and the μ_i two-valued, where, obviously, μ_0 may be zero and there may be no $\mu_1, \mu_2, \cdots$ present.

In this talk we present a generalization of this theorem valid for modular measures defined on lattice ordered effect algebras. Effect algebras are structures $(E; \oplus, 0, 1)$ based on a partial addition $\oplus$ which is associative, commutative and cancellative.