DECOHERENT PAIRS OF STRUCTURAL PROJECTIONS ON A PRE-SYMMETRIC SPACE

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ABSTRACT. Pre-symmetric complex Banach spaces have been proposed as models for state spaces of physical systems. A neutral GL-projection on a pre-symmetric space represents an operation on the corresponding system, and has as its range a further pre-symmetric space which represents the state space of the resulting system. Every L-projection is a neutral GL-projection, and such a projection represents a classical operation. Two neutral GL-projections R and S on the pre-symmetric space A_* represent decoherent operations when their ranges are rigidly collinear. It is shown that if R and S each satisfy a condition, a possible physical interpretation of which is that the information lost in their measurement is partially recoverable, then R and S have as supremum $R+S$ and the operations corresponding to R, S and $R+S$ are simultaneously performable. Furthermore, it is shown that the smallest L-projection majorizing R, S and $R+S$ coincide, and the greatest L-projection majorized by $R+S$ is identified.

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