

## FACIAL SETS OF PROBABILITY MEASURES

Gottfried T. Rüttimann

*Abstract:* This is a discussion of probability measures in a noncommutative setting as required by quantum mechanical probability theory. The concepts of a facial, orthostable and orthofacial subset of probability measures on an orthomodular poset are introduced. They provide a link between the poset and the boundary structure of convex sets of such measures.

An orthomodular poset admitting a facial subset  $\Delta$  has interesting properties: e.g. it is a complete lattice and every element in  $\Delta$  is a completely additive measure. We investigate the connection between orthostability and the Jordan-Hahn decomposition of measures. It is shown that the set of completely additive probability measures on the projection lattice of a von Neumann algebra is orthofacial. Finally we use the notion of orthofaciality of a subset  $\Delta$  of probability measures on an orthomodular poset to give a necessary and sufficient condition for each bounded affine functional on  $\Delta$  to be the expectation functional of some observable having finite spectrum.

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