Generalizations of Kochen and Specker's Theorem and the Effectiveness of Gleason's Theorem

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Abstract

Kochen and Specker's theorem can be seen as a consequence of Gleason's theorem and logical compactness. Similar compactness arguments lead to stronger results about finite sets of rays in Hilbert space, which we also prove by a direct construction. Finally, we demonstrate that Gleason's theorem itself has a constructive proof, based on a generic, finite, effectively generated set of rays, on which every quantum state can be approximated.

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