**Introduction to Quantum Measure Theory**

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Although quantum computing usually represents a quantum state as a density matrix, the density matrices are not what could be measured directly in an experiment. When repeating an experiment, the best we might get is usually a probability measure, and a family of probability measures could be identified as density matrices according to Gleason’s theorem. Since real experiments are not always perfect, their inducing probability measures might preferably be modelled by interval-valued ones. We then extended this kind of interval-valued probability measure to the quantum domain, and found even if not all the quantum interval-valued probability measures could correspond to density matrices, we could still define expectation values according to a quantum version of Choquet integral and proved an imprecise version of Gleason and Kochen-Specker theorems.