

Abstract Submitted
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Exploring Qutrits through Symmetric Informationally Complete Measurements¹ GELO NOEL TABIA, Univ. of Waterloo/ Perimeter Institute —

By representing quantum states as probability distributions induced by symmetric, informationally complete measurements (or SICs), we uncover some fundamental properties of the qutrit state space that are not immediately recognizable in the usual Hilbert space picture. In addition, we present a detailed study of all eight (non-unitarily equivalent) one-parameter families of SICs in dimension three, the relationships among the various probability distributions they generate, and the structure coefficients for $\mathfrak{gl}(3, \mathbb{C})$ they give rise to. An experimental realization of a qutrit SIC-POVM via weak measurements by the Steinberg group at the University of Toronto [1] provides an excellent venue for highlighting the practical significance of some of our theoretical results.

[1] Z.E.D. Medendorp, et al., “Simulating a Qutrit SIC-POVM using Weak Measurements,” poster presented at Quantum Works – 2009.

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