

Abstract Submitted  
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**A Linear Dependency Structure Arising from Weyl-Heisenberg Symmetry**<sup>1</sup> HOAN BUI DANG, Perimeter Institute and University of Waterloo, MARCUS APPLEBY, Perimeter Institute, INGEMAR BENGTTSSON, KATE BLANCHFIELD, Stockholm University, ASA ERICSSON, CHRISTOPHER FUCHS, Perimeter Institute, MATTHEW GRAYDON, GELO TABIA, Perimeter Institute and University of Waterloo — The Weyl-Heisenberg (WH) group was used by Hermann Weyl to construct finite-dimensional quantum mechanics in the earliest days of the theory and, through its ubiquitous use in quantum information theory, is even more important today. While investigating properties of symmetric informationally-complete (SIC) measurements, we found a linear dependency structure in a class of Weyl-Heisenberg covariant sets when certain conditions on the dimensionality of the Hilbert space are met. This result reveals more structure in WH symmetry than previously noted and helps us gain a better understanding of quantum state space. For example in the Quantum Bayesian framework of Fuchs and collaborators, the number of zeros of a quantum state in a SIC representation is directly related to this linear dependency.

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Hoan Bui Dang  
Perimeter Institute and University of Waterloo

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