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Title: Geometric and algebraic problems on quantum interaction models

Abstract:

We will focus spectral structure of the quantum Rabi model (QRM) and its asymmetric version (AQRM), which are widely studied as most fundamental models of light-matter interactions, and their covering model. The latter model is called non-commutative harmonic oscillator (NCHO) and has rich but mysterious arithmetic properties. Certain algebraic and geometric problems/conjectures arose from the study of the degeneracy of the spectrum and hidden symmetry for AQRM will be presented. The contents are based on the joint work with Cid Reyes-Bustos.