Abstract Submitted
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**Decoherence effects of a charge detector on a nearby quantum dot**[1] DAVID RUIZ-TIJERINA, Ohio University, EDSON VERNEK, Universidade Federal de Uberlandia, GEORGE MARTINS, Oakland University, SERGIO ULLOA, Ohio University and Freie Universitat — We study the effects of a charge detector, implemented by a quantum point-contact (QPC), on the Kondo state of an adjacent spin-1/2 quantum dot (QD). The Coulomb interaction between electrons traversing the QPC and those within the QD contribute to charge fluctuations and decoherence of the Kondo state in the QD, which can be detected through conductance measurements. Modeling the QPC as two current leads coupled through a localized level near resonance with the Fermi level of the leads, one can explore different transport regimes of the detector: Coulomb blockade, ballistic resonant-transport, and a Kondo screening state (associated with the "0.7 anomaly"). Transitions between different states are achieved by tuning the capacitive coupling $u$, or the local gates in the QPC. The transitions are studied using Varma–Yafet variational techniques, providing interesting insights into the different regimes. We employ numerical renormalization-group calculations to accurately evaluate the spectral densities and conductance behavior of the coupled QPC–QD system. We report the dependence of the Kondo temperatures of both subsystems on the capacitive coupling strength $u$, and describe the phases' signatures in the local spectral densities and the conductance profile of the QPC.

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David Ruiz-Tijerina
Ohio University

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