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Conductance oscillations in a non-proportionally-coupled dot-cavity system in the Kondo regime.[1] LUIS DIAS DA SILVA, Universidade de Sao Paulo, CAIO LEWENKOPF, Universidade Federal Fluminense, EDSON VERNEK, GERSON FERREIRA, Universidade Federal de Uberlandia, SERGIO ULLOA, Ohio University — The well-known Meir and Wingreen conductance formula [1] for interacting systems is limited in application to "proportionally coupled" terminals. We extend this formalism to consider non-proportionally-coupled structures, such as the quantum dot (QD)-quantum cavity (QC) geometry recently realized in Ref.[2]. We study an interacting QD connected coherently to tunable electronic cavity modes. The QD and the QC are coupled to the right lead but only the QD is coupled to the left lead. This non-proportionally coupled geometry is shown to exhibit a well defined Kondo effect over a wide range of the QD-QC coupling strength. Owing to quantum interference, changes in the cavity geometry dramatically modify the conductance and the spin configuration of the QD. Our numerical renormalization group calculations show that the cavity modes modulate the effective density of metallic states coupled to the QD, inducing unexpected splittings in the Kondo resonances. Moreover, the calculated conductance through the device exhibits oscillatory Fano-like features at large QD-QC couplings, while maintaining strong spin correlations with the electronic reservoir, in agreement with recent experimental results[2]. [1] Meir and Wingreen, PRL 68 2512 (1992) [2] C. Rossler et al., PRL 115 166603 (2015)

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Luis Dias da Silva
Universidade de Sao Paulo

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