

Abstract Submitted
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Designer switches: Effect of contact geometry on the transient current of a strongly correlated quantum dot¹ ALI IHSAN GOKER, Bilecik University, ZHIYONG ZHU, UDO SCHWINGENSCHLOGL, AURELIEN MANCHON, King Abdullah University of Science and Technology — The time-dependent non-crossing approximation is utilized to investigate the influence of the geometry of contacts made of gold on time dependent current through a quantum dot suddenly shifted into the Kondo regime via a gate voltage. For an asymmetrically coupled system, instantaneous conductance exhibits complex fluctuations. We identify the frequencies participating in these fluctuations and they turn out to be proportional to the separation between the sharp features in the density of states and the Fermi level. Increasing ambient temperature or bias quenches the amplitude of these fluctuations. This suggests that the interference between the emerging Kondo resonance and the van Hove singularities in the density of states is the underlying microscopic mechanism for these fluctuations. Based on these observations, we predict that using different electrode geometries would give rise to drastically different transient currents which can be accessed with state-of-the-art ultrafast pump-probe techniques.

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