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Universality and scaling in a charge two-channel Kondo device

LARS FRITZ, Utrecht University, The Netherlands, ANDREW MITCHELL, University College Dublin, ERAN SELA, AVIAD LANDAU, Tel Aviv University, Israel — We study a charge two-channel Kondo model, demonstrating that recent experiments [Iftikhar et al., Nature 526, 233 (2015)] realize an essentially perfect quantum simulation – not just of its universal physics, but also nonuniversal effects away from the scaling limit. Numerical renormalization group calculations yield conductance lineshapes encoding RG flow to the critical point. By mimicking the experimental protocol, the experimental curve is reproduced quantitatively, although we show that far greater bandwidth/temperature separation is required to obtain the universal result. Fermi liquid instabilities are also studied: In particular, our exact analytic results for non-linear conductance provide predictions away from thermal equilibrium, in the regime of existing experiments.

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