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Two-impurity Kondo physics in a mesoscopic device LUCAS PEETERS, Stanford University, ANDREW MITCHELL, University College Dublin, VLADIMIR UMANSKY, Weizmann Institute of Science, DAVID GOLDHABER-GORDON, Stanford University — When two quantum impurities are coupled both to each other and to a many-body electron reservoir, the outcome of the competition between inter-impurity (RKKY) and impurity-bath (Kondo) interactions can lead to a dramatic range of electronic behaviors. This two-impurity Kondo (2IK) problem is the basic building block of the Kondo lattice which is suspected to underlie much of the interesting but complex phenomenology seen in the heavy-fermion materials. We realize a mesoscopic model of this building block on a GaAs/AlGaAs heterostructure, allowing us to controllably vary the coupling between two quantum dots and their many-body baths, and explore the resulting conductance signature.

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