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Treatment of High Conductance Kondo Transport in Single Molecule Devices GAVIN D. SCOTT, Bell Laboratories, Alcatel-Lucent, 600 Mountain Ave, Murray Hill, NJ 07974, DOUGLAS NATELSON, Department of Physics and Astronomy and Department of Computer and Electrical Engineering, Rice University, 6100 Main St, Houston, TX 77005, STEFAN KIRCHNER, Max Planck Institute for the Physics of Complex Systems and Max Planck Institute for Chemical Physics of Solids, 01187 Dresden, Germany , ENRIQUE MUÑOZ , Facultad de Fìsica, Pontificia Universidad Catòlica de Chile, Casilla 306, Santiago 22, Chile — A single molecule break junction device serves as a tunable model system for probing the many body Kondo state. There are predictions of universality across many realizations of the Kondo model in which the response of the system to different perturbations is characterized by a single emergent energy scale, $k_B T_K$. Comparisons between different experimental systems have shown issues with numerical consistency. With a new constrained analysis examining the response of conductance to temperature, bias, and magnetic field perturbations simultaneously, we show that these deviations from universality can be resolved by properly accounting for background, non-Kondo contributions to the conductance that are often neglected. We clearly demonstrate the importance of these non-Kondo conduction channels by examining transport in devices with total conductances exceeding the theoretical maximum due to Kondo-assisted tunneling alone.

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