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Numerical study of a mobile magnetic impurity in a one-dimensional quantum liquid JULIAN RINCON, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee, DANIEL GARCIA, KAREN HALLBERG, Centro Atomico Bariloche and Instituto Balseiro, CNEA, CONICET, Bariloche, Argentina, MATTHIAS VOJTA, Institut fuer Theoretische Physik, Technische Universitaet Dresden, 01062 Dresden, Germany — We study a mobile spin-1/2 impurity, coupled antiferromagnetically to a one-dimensional gas of fermions. Combining perturbative ideas and extensive density matrix renormalization group calculations, we study the interplay between the screening of the impurity by the electrons and the kinetic and magnetic properties of the impurity. We show that this problem displays a quantum phase transition between one- and two-channel Kondo physics. Using finite-size scaling, we construct a ground-state phase diagram and discuss various non-trivial regimes.

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