Magnetic frustration in itinerant systems: the Kondo polaron problem LEONID ISAEV, Louisiana State University, CRISTIAN BATISTA, T4, Los Alamos Natl Lab, ILYA VEKHTER, Louisiana State University — We study the interplay between magnetic frustration and Kondo screening in Kondo lattices by analyzing the J_1-J_2 antiferromagnetic chain coupled to a conduction band. The system is tuned to the Majumdar-Ghosh point $J_2 = J_1/2$ which stabilizes a dimer valence-bond solid at weak Kondo coupling J_K. We use an effective low-energy theory to demonstrate that sufficiently large J_K results in a proliferation of "Kondo polarons", i.e. Kondo-screened domain-wall excitations of the dimer state, and collapse of the dimer order via a 2nd order quantum phase transition. At the quantum critical point, $J_K = J_K^c$, these polarons become gapless, and we argue that the transition itself belongs to a 2D Ising universality class. For $J_K > J_K^c$ increasing concentration of the polarons leads to a continuous growth of the electron Fermi momentum until all spins are absorbed by the Fermi sea.

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Date submitted: 08 Nov 2012   Electronic form version 1.4