

Spin and lattice effects in the Kondo lattice model

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The magnetic properties of a system of coexisting localized spins and conduction electrons are investigated within an extended version of the one dimensional Kondo lattice model where effects stemming from the electron-lattice and the on-site Coulomb interactions are explicitly included. After bosonizing the conduction electrons, it is observed that intrinsic inhomogeneities with the statistical scaling properties of a Griffiths phase appear which determine the spin structure of the localized impurities, and also exhibit a quantum (order-disorder) critical point. The appearance of the inhomogeneities is enhanced by appropriate phonons and acts destructively on the spin ordering. Since the inhomogeneities appear on well defined length scales, intrinsic mesoscopic metastable patterns develop, yielding a close analogy to a two-fluid system.