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Low-temperature properties of strongly correlated nanoclusters in the presence of magnetic field YAN LUO, NICHOLAS KIOUSSIS, California State University Northridge — Nano-sized particles and clusters exhibit different thermal and magnetic properties from both individual atoms and bulk properties in a material. We have used exact diagonalization calculations to study the specific heat, the susceptibility and short-range spin-spin correlations at low temperature in the present of an external magnetic field. The calculations reveal that the external magnetic field and the energy spacing Δ in the conduction band tune the interplay between the *local* Kondo and *non local* RKKY interactions. The field-induced level crossing of the low-lying many-body states gives rise to a rich magnetic behavior of the nanoclusters. We find a transition from antiferromagnetic to ferromagnetic state as the cluster size is reduced. This may be relevant to experimental realizations of small rings or isolated quantum dots with tunable magnetic properties.

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