

Magnetic polarons

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EuB6 exhibits anomalous physical properties. We have studied the role of the magnetic polaron in electronic, magnetic, transport, and thermal properties of EuB6. We have investigated the ferromagnetic Kondo lattice model by using the Monte-Carlo method incorporating the exact diagonalization. We have demonstrated that, upon cooling, the isolated magnetic polarons become linked to yield the finite magnetization at T_C , and then the linked magnetic polarons eventually merge to show the percolating behavior with the specific heat peak at T_p ($T_p < T_C$). We have also studied the optical conductivity and the density of states (DOS) for the magnetic polaron model. Both the optical conductivity and the DOS show clear and consistent evidence for the pseudogap formation in the magnetic polaron state.