

Magnetic Phase Diagrams and Resistivity in an Extended Two-band Kondo Lattice Model with Respect to CMR-Materials

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We use an extended two-band Kondo Lattice Model (KLM) to investigate the occurrence of different (anti-)ferromagnetic phases depending on several model parameters. With regard to CMR-materials like the manganites we have added a Jahn-Teller term, direct antiferromagnetic coupling and Coulomb interaction to the KLM. The electronic properties are calculated in an interpolating self-energy approach with no restriction to classical spins. We present zero-temperature phase diagrams which show a strong influence of the important parameters (Hund's coupling, direct antiferromagnetic exchange, Jahn-Teller distortion) and of the type of Coulomb interaction (intraband, interband). Some of these calculations can be extended to finite temperatures using a modified RKKY treatment. This makes the calculation self-consistent in the electronic and magnetic part. The results are in very good agreement with experimental measurements for different manganites.

← 13.4 cm →

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9.7 cm