OPTICAL CONDUCTIVITY AND ORBITAL DYNAMICS IN MANGANITES

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Doped manganites show a complex interplay of spin-, charge-, orbital- and lattice degrees of freedom. The theoretical discussion starts from the orbital degenerate Kondo lattice model neglecting effects from electron-phonon coupling. The anomalous spectral change of the optical conductivity as well as the change of orbital order and orbital excitations upon doping will be discussed [1,2] with particular emphasis on the anomalous ferromagnetic state of manganite systems. Results from finite temperature Lanczos diagonalization (FTLD) will be presented and compared to other theoretical approaches to orbital excitations, like slave-fermion/Schwinger boson or linear orbital wave theory for doped [2] and undoped systems [3], respectively. Furthermore FTLD results for the spin-dynamics of layered manganites in the paramagnetic phase will be presented and discussed in the framework of ferromagnetic polarons.

[1] P. Horsch, J. Jaklič, and F. Mack, Phys. Rev. B. **59**, 6217 (1999).
[2] F. Mack and P. Horsch, Phys. Rev. Lett. **82**, 3160 (1999).
[3] J. van den Brink, P. Horsch, F. Mack, and A.M. Oleś, Phys. Rev. B **59**, 6795 (1999).

9.7 cm

13.4 cm

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