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Tight Binding Study of the Role of Charge Ordering in Colossal Magnetoresistive Manganites

S PANDA[1†], J K KAR[2] and G C ROUT[3]

[1]Trident Academy of Technology, Chandaka Industrial Estate, Patia - 751024, Bhubaneswar, India.
[2]College of Engineering Bhubaneswar, Patia - 751024, Bhubaneswar, Odisha, India.
[3]Condensed Matter Physics Group, Physics Enclave, Plot No.- 664/4825, Lane-4A, Shree Vihar, Patia, Bhubaneswar -751031, Odisha, India. Email: gcr@iopb.res.in. Mob: 09937981694.
[†]Corresponding Author, Email: saswatip7@gmail.com

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Abstract. Doped rare-earth manganese oxides exhibit a rich phase diagram with a strong interplay between lattice, charge, spin and orbital degrees of freedom. We report here a tight binding model Hamiltonian consisting of AFM spin fluctuations in core band, double exchange interactions among conduction and core band electron spins and charge density wave interaction in the conduction band as an extra mechanism. The model Hamiltonian is solved using Zubarev's Green's function technique. The effect of first and second nearest neighbour interactions on thermal properties of manganite systems is studied.

Keywords: CMR, Charge orderings, antiferromagnetics, entropy

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[Full Paper]