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Recent studies of models for manganites in the bulk and in superlattices[1]

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In this talk, we will review our recent double-exchange model studies for manganites and some related experimental discoveries. First, we will briefly address the existence of a clear CMR effect in numerical simulations, and the short-range spin and charge correlations and local density of states in this CMR regime [1,2]. Second, we will analyze manganite superlattices $(LaMnO_3)_{2n}/(SrMnO_3)_n$. The reconstruction of charge density, spin order, and orbital order at the interfaces and the relation with a novel experimentally observed metal-insulator transition (MIT) at $n = 3$ will be discussed [3]. Finally, the multiferroic spiral spin order in the undoped manganite RMnO$_3$ (R=Tb, Dy) will also be briefly studied under the double-exchange framework [4].

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[4] S. Dong, R. Yu, S. Yunoki, J.-M. Liu, and E. Dagotto, Phys. Rev. B 78, 155121 (2008).

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