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Colossal resistivity change besides magnetoresistance: an extended theoretical framework for electronic transport of manganites
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— Current theoretical approaches to manganites mainly stem from magnetic framework, in which the electronic transport is thought to be spin-dependent. However, quite a number of experimental observations can yet not be reasonably explained. An extended framework for electronic transport of manganites has been proposed, in which the total resistivity has been partitioned into two parts: ρ_s and ρ_c in terms of two different mechanisms: spin-dependent and charge-dependent. Correspondingly, the colossal magnetoresistance (CMR) classification inherited from Aliaga et al has been extended as: CMR2 and XR, where CMR2 is the classical spin-dependent process while XR is spin-independent. We emphasize the important role of XR which helps to understand the true mechanism of CMR.

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