

## Lattice effects on the magnetoresistance in doped manganese perovskites (abstract)

H. Y. Hwang, S-W. Cheong, P. G. Radaelli, M. Marezio, T. T. M. Palstra, and B. Batlogg

Citation: *Journal of Applied Physics* **79**, 4541 (1996); doi: 10.1063/1.361716

View online: <https://doi.org/10.1063/1.361716>

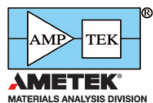
View Table of Contents: <http://aip.scitation.org/toc/jap/79/8>

Published by the *American Institute of Physics*

---

---

### Ultra High Performance SDD Detectors



See all our XRF Solutions

## Lattice effects on the magnetoresistance in doped manganese perovskites (abstract)

H. Y. Hwang,<sup>a)</sup> S-W. Cheong, P. G. Radaelli,<sup>b)</sup> M. Marezio,<sup>c)</sup> T. T. M. Palstra, and B. Batlogg

*AT&T Bell Laboratories, Murray Hill, New Jersey 07974*

A detailed study of doped  $\text{LaMnO}_3$  with fixed carrier concentration has revealed a direct relationship between the Curie temperature  $T_c$  and the average ionic radius of the La site  $\langle r_A \rangle$ , which is varied by substituting rare earths of different ionic radii for La. With decreasing  $\langle r_A \rangle$  magnetic order and significant magnetoresistance occur at lower temperatures with increasing temperature hysteresis, and the magnitude of the magnetoresistance increases dramatically. The predominant structural effect of decreasing  $\langle r_A \rangle$  is to decrease the Mn–O–Mn bond angle, which is accompanied by slight variations in the Mn–O bond distance. These results demonstrate that the notion of “double exchange” must be generalized to include changes in the Mn–Mn electronic hopping element as a result of microstructural changes induced by composition, temperature and pressure variations. © 1996 American Institute of Physics. [S0021-8979(96)58908-6]

---

<sup>a)</sup>Also Joseph Henry Laboratories of Physics, Princeton University, Princeton, New Jersey 08544.

<sup>b)</sup>Institut Laue-Langevin, BP 156, 38042 Grenoble Cedex 9, France.

<sup>c)</sup>Also Laboratoire de Cristallographie, CNRS-UJF, BP 166, 38042 Grenoble Cedex 9, France.