

Abstract Submitted
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**Doping Dependence of
Polaron Correlations in Bilayer Manganites¹**

RAYMOND OSBORN, STINE KLAUSEN, STEPHAN ROSENKRANZ, PETER CHUPAS, JOHN MITCHELL, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439 — It is now well established that colossal magnetoresistance (CMR) in manganite compounds is strongly enhanced by competing interactions close to the magnetic phase transitions. In the paramagnetic phase of the bilayer manganites, diffuse x-ray scattering data has shown evidence of polaron correlations that grow with decreasing temperature and coexist with the critical magnetic fluctuations down to the ferromagnetic phase transition, before collapsing below T_C . These correlations, which have a length scale of about 20\AA , are in the form of longitudinal Jahn-Teller stripes within the bilayers, characterized by an incommensurate wavevector. There have been proposals that these nanoscale correlations are evidence of an incipient charge density wave, whose wavevector corresponds to nesting features in the Fermi surface. We report new measurements of the doping dependence of these correlations that show that the wavevector increases from 0.26 at a hole doping of $x = 0.32$ to about 0.3 at $x = 0.46$, which is inconsistent with the anticipated change in the Fermi surface volume, and will discuss alternate models of the short-range order.

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