

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Implications of a dimeron magnetic pair model for CMR manganites.¹ FRANK BRIDGES, LISA DOWNWARD, UC Santa Cruz — Recently, based on extensive EXAFS data, we have proposed a magnetic pair model for clusters that exist above the ferromagnetic transition temperature, T_c [1]. The magnetic clusters must contain equal numbers of hole and electron Mn sites and have a reduced distortion compared to the remaining Jahn-Teller distorted electron sites. The smallest such unit (one electron and one hole site) we call a dimeron - it is an electron delocalized over two Mn sites. Here we consider why such a model might be stable, possible configurations of the local distortions for the site pair, and the implications for filamentary clusters throughout the sample when it is only partially magnetized. We also address electrical transport via hopping dimerons and include the coulomb interactions between dimerons and the Ca(+2) dopants, which provides a quenched-in disorder. Several open questions such as the possible interactions between dimerons will also be discussed.

[1] L. Downward et. al., Phys Rev Lett. 95, 106401 (2005).

¹Supported by NSF grant DMR0301971.

Frank Bridges
UC Santa Cruz

Date submitted: 29 Nov 2005

Electronic form version 1.4