Contribution ID: **37** Type: **not specified**

LOCAL PROBE STUDIES NEAR THE CHARGE ORDER AND MAGNETIC TRANSITIONS IN Pr1-xCaxMnO3

Tuesday 7 February 2006 16:55 (20 minutes)

The Pr1-xCaxMnO3 displays a variety of phase transitions associated with the spin, lattice, charge and orbital degrees of freedom [1],[2]. PrMnO3 and CaMnO3 are antifeerromagnetic, and low doped (x<0.32) samples are ferromagnetic below Tc˜130K. For 0.32<x<0.90 the system presents a robust Charge Order state (CO) for temperatures below TCO˜150-235 K and an antiferromagnetic insulator state below TN˜100-180 K. Detailed real-space atomic-scale information is necessary to achieve better undertanding of such order/disorder effects.
111mCd⊠111Cd Perturbed Angular Correlation (PAC) studies were used to infer about atomic-scale distortions in the temperature range 10-600K encompassing the charge,orbital and magnetic ordering transitions. The electrical-field gradient (EFG) generated by the charge distribution around the probe shows strong anomalies when the system undergoes the charge-order transition. In particular, the principal component of the EFG (Vzz) presents a sharp discontinuity at the CO transition.

[1] Y. Tomioka et al. Phys. Rev. B 53, 1689 (1996)
[2] M. S. Reis et al., Phys. Rev. B 71, 144413 (2005)

Author: AMARAL, Vitor (Universidade de Aveiro, Portugal)

Co-authors: LIMA LOPES, Armandina Maria (Universidade de Aveiro, Portugal); RITA, E. (ITN, Sacavém, Portugal); CORREIA, J. G. (ITN, Sacavém, Portugal); ARAÚJO, J. P. (Universidade do Porto, Portugal); REIS, M. S. (Universidade de Aveiro, Portugal); TAVARES, P. B. (UTAD, Vila Real, Portugal); MENDONÇA, T. M. (Universidade do Porto, Portugal); TOKURA, Y. (University of Tokyo, Japan); TOMIOKA, Y. (JRCAT, Tsukuba, Japan)

Presenter: AMARAL, Vitor (Universidade de Aveiro, Portugal)

Session Classification: Solid State Physics