Contribution ID: **117** Type: **Talk**

Cupric Oxide: a model system to explain high-Tc superconductivity ?

Friday, 16 September 2011 09:40 (30 minutes)

Cupric oxide (CuO) has recently attracted much interest as a magnetically driven multiferroic with the highest Tc (˜230K). In this material a non-collinear spiral magnetic order (215K<T<230K) breaks crystal inversion symmetry, inducing ferroelectricity. We use resonant x-ray diffraction at the Cu L edges to probe the subtle changes in the Cu electronic structure occurring at the appearance of multiferroicity and test the magnetic ground-state, proposed by neutron diffraction, to be a collinear antiferromagnet. In both phases we have found a strong dependence of the diffracted intensity on the polarization of the incident light. Such dependence is totally unexpected in a simple collinear antiferromagnetic phase. In this model the Cu magnetic moment are aligned (antiferromagnetically) along the b-axis. The observed polarization dependence could reflect and be a direct measurement of the presence of orbital currents surrounding the Cu ions. Such observations are long sought proofs for theoretical model explaining the behavior of the normal state of high-Tc superconductors. Understanding such state is the key to unravel the true origin of the superconducting phase transition in cuprates materials.

Please specify the session

RIXS

Please specify poster or talk

Talk

Primary author: Dr SCAGNOLI, V (Swiss Light Source, Paul Scherrer Institut, CH 5232 Villigen PSI, Switzerland)

Co-authors: Prof. BOOTHROYD, A T (Department of Physics, University of Oxford, Clarendon Laboratory, Parks Road, Oxford OX1 3PU, UK); Dr PRABHAKARAN, D (Department of Physics, University of Oxford, Clarendon Laboratory, Parks Road, Oxford OX1 3PU, UK); Dr GARGANOURAKIS, M (Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland); Dr DE SOUZA, R (Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland); Prof. LOVESEY, S W (ISIS Facility, RAL, Oxfordshire OX11 0QX, UK); Dr STAUB, U (Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland); Dr BODENTHIN, Y (Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland)

Presenter: Dr SCAGNOLI, V (Swiss Light Source, Paul Scherrer Institut, CH 5232 Villigen PSI, Switzerland)

Session Classification: Resonant Inelastic and Elastic X-ray Scattering

Track Classification: Resonant Inelastic and Elastix X-ray Scattering