



Contribution ID: 53

Type: **Poster**

## Magnetic anisotropy in the geometrically frustrated system CuFeO<sub>2</sub>

*Friday, 16 September 2011 12:33 (2 minutes)*

The compound CuFeO<sub>2</sub> has a delafossite structure where triangular layers of magnetic Fe<sup>3+</sup> are separated by non-magnetic Cu<sup>1+</sup> and O<sup>2-</sup> layers. CuFeO<sub>2</sub> orders in a collinear four sublattice (4SL) structure below TN<sub>2</sub>=11K, with the magnetic moments along c. Associated with TN<sub>2</sub> is a first order structural transition from hexagonal to orthorhombic. For temperature between TN<sub>1</sub>=14K and TN<sub>2</sub> the system is in an incommensurate magnetic phase. One puzzling question about this system concerns its strong magnetic anisotropy observed. Fe<sup>3+</sup> (d<sup>5</sup>), which is the only magnetic ion in the system, has a spin only ground state, so no anisotropy is expected. That motivated us to use x-ray magnetic circular dichroism (XMCD) probing separately the orbital and spin moments of the Fe<sup>3+</sup> ions. In this work we present our XMCD data on Fe L-edges as a function of temperature revealing how the spin and orbital moments vary across the phase transition in CuFeO<sub>2</sub>. These results are discussed in the context to the observed magnetic anisotropy.

### Please specify the session

Multiple order Parameter Systems

### Please specify poster or talk

talk

**Primary author:** Dr PIAMONTEZE, Cinthia (Paul Scherrer Institut)

**Co-authors:** FRAILE RODRIGUEZ, Arantxa (Departament de Física Fonamental and Institut de Nanociència i Nanotecnologia (IN2UB), Universitat de Barcelona); Prof. NOLTING, Frithjof (Paul Scherrer Institut); Prof. BRUNE, Harald (Institute of Condensed Matter Physics (ICMP), Ecole Polytechnique Féderale de Lausanne); Dr DREIER, Jan (Paul Scherrer Institut); TERADA, Noriki (National Institute for Materials Science); Dr RUSPONI, Stefano (Institute of Condensed Matter Physics (ICMP), Ecole Polytechnique Féderale de Lausanne); Dr STAUB, Urs (Paul Scherrer Institut)

**Presenter:** Dr PIAMONTEZE, Cinthia (Paul Scherrer Institut)

**Session Classification:** Poster session II and lunch

**Track Classification:** Poster Session II (Friday)