Contribution ID: **52** Type: **Poster**

Femtosecond magnetic order dynamics of a multiferroic phase transition

Monday 4 April 2011 16:30 (2h 30m)

We report on an experimental demonstration of the ultrafast switching of magnetic order in a single crystal of CuO. In the experiment, a femtosecond laser pulse initiates a transition from a collinear antiferromagentic structure to a spiral, multiferroic magnetic structure. The first steps occur on time scales ranging from 400 fs to 2 ps, depending on the strength of the excitation. At the strongest excitation levels, the time scale is limited by the period of long-wavelength magnetic excitations in CuO. This has implications for the design of devices that rely upon high speed control over magnetism, particularly in multiferroic materials.

Author: JOHNSON, Steven (Paul Scherrer Institut)

Co-authors: BOOTHROYD, Andrew (Oxford); CAVIEZEL, Andrin (PSI); PRABHAKARAN, Dharmalingam (Oxford); DOERING, Dionisio (LBNL); LU, Donghui (SLAC); VOROBEVA, Ekaterina (PSI); INGOLD, Gerhard (PSI); TURNER, Joshua (SLAC); PATTHEY, Luc (PSI); TRIGO, Mariano (SLAC); YI, Ming (Stanford); KRUPIN, Oleg (SLAC and XFEL); KIRCHMAN, Patrick (SLAC); BEAUD, Paul (PSI); DENES, Peter (LBNL); DE SOUZA, Raquel (PSI); MOORE, Robert (SLAC); STAUB, Urs (PSI); SCAGNOLI, Valerio (PSI); LEE, Wei-Sheng (SLAC); SCHLOTTER, William (SLAC); CHUANG, Yi-De (LBNL); HUSSAIN, Zahid (LBNL); SHEN, Zhi-Xun (Stanford and SLAC)

Presenter: JOHNSON, Steven (Paul Scherrer Institut)

Session Classification: Poster session