



Contribution ID: 174

Type: **Talk**

【106】 Investigation of the phase transition driven by ultrashort laser pulses in the charge-density-wave material $K_{0.3}MoO_3$

Tuesday 10 September 2024 15:15 (15 minutes)

Blue Bronze ($K_{0.3}MoO_3$) is a quasi 1D material exhibiting a charge-density-wave (CDW) with a periodic lattice distortion (PLD). In a time resolved x-ray experiment at SwissFEL, we study the dynamics of the PLD by pumping $K_{0.3}MoO_3$ with short laser pulses and probing it using x-ray diffraction. We construct reciprocal space maps (RSM) of superlattice reflections at different delays. The RSMs indicate a transient but not persistent flip of the phase of the CDW. We attribute the suppression of the diffracted x-ray intensity after this flip to a fast decoherence of the CDW driven by pinning of the phase of the CDW in the material indicating an order-disorder like phase transition.

Author: WINKLER, Rafael T. (ETH Zürich)

Co-authors: NAG, Abhishek (SwissFEL, Paul Scherrer Institute, Villigen); OGGENFUSS, Alexander R. (SwissFEL, Paul Scherrer Institute, Villigen); ARRELL, Christopher (SwissFEL, Paul Scherrer Institute, Villigen); BABICH, Danylo (SwissFEL, Paul Scherrer Institute, Villigen); SORANZIO, Davide (ETH Zürich); DIVALL, Edwin J. (SwissFEL, Paul Scherrer Institute, Villigen); ABREU, Elsa (ETH Zürich); LEMKE, Henrik (SwissFEL, Paul Scherrer Institute, Villigen); ZEMP (DÖSSEGGGER), Janine (ETH Zürich); DEMSAR, Jure (Faculty Institute of Physics, Johannes Gutenberg-University Mainz); BOIE, Larissa (ETH Zürich); SANDER, Mathias (SwissFEL, Paul Scherrer Institute, Villigen); SAVOINI, Matteo (ETH Zürich); BEAUD, Paul (SwissFEL, Paul Scherrer Institute, Villigen); MANKOWSKY, Roman (SwissFEL, Paul Scherrer Institute, Villigen); GURUNG, Sabina (ETH Zürich); NORTON, Samuel (ETH Zürich); ZERDANE, Serhane (SwissFEL, Paul Scherrer Institute, Villigen); BIASCO, Simone (ETH Zürich); JOHNSON, Steven (ETH Zürich); SUTER, Tim (ETH Zürich); STAUB, Urs (SwissFEL, Paul Scherrer Institute, Villigen); OVUKA, Vladimir (ETH Zürich); DENG, Yunpei (SwissFEL, Paul Scherrer Institute, Villigen)

Presenter: WINKLER, Rafael T. (ETH Zürich)

Session Classification: Condensed Matter Physics (KOND)

Track Classification: Condensed Matter Physics (KOND)