Contribution ID: **203** Type: **Talk**

【717】Replicating the short-time recovery of a charge density wave state after photoexcitation

Thursday 24 August 2017 17:15 (15 minutes)

We used ultrashort x-ray pulses to monitor the structural dynamics associated with the charge density wave (CDW)-state in K0.3MoO3 after photoexcitation. In a first experiment the response to different excitation fluences was investigated. Starting in a regime of coherent oscillations, increasing the excitation fluence leads to a complete melting of the ordered state. Remarkably, a further increase in fluence results in a short recovery of the CDW on a sub-picosecond time scale. In follow-up measurements, we could create a second recovery by applying another photoexcitation to the first one. An understanding of the microscopic mechanisms of this recovery may enhance our theoretical understanding of ultrafast CDW transitions in general.

Author: Mr NEUGEBAUER, Martin Josef (Institute for Quantum Electronics, Physics Department, ETH Zürich)

Co-authors: Dr HUBER, Tim (Institute for Quantum Electronics, Physics Department, ETH Zürich); Dr SAVOINI, Matteo (Institute for Quantum Electronics, Physics Department, ETH Zürich); Dr GRÜBEL, Sebastian (Swiss Light Source, Paul Scherrer Institut); Mr HUBER , Lucas (Institute for Quantum Electronics, Physics Department, ETH Zürich); Dr KUBACKA , Teresa (Institute for Quantum Electronics, Physics Department, ETH Zürich); Mr DORNES , Christian (Institute for Quantum Electronics, Physics Department, ETH Zürich); Dr ABREU, Elsa (Institute for Quantum Electronics, Physics Department, ETH Zürich); Mr KUBLI, Martin (Institute for Quantum Electronics, Physics Department, ETH Zürich); Dr BOTHSCHAFTER, Elisabeth (Swiss Light Source, Paul Scherrer Institut); Dr RETTIG, Laurenz (Swiss Light Source, Paul Scherrer Institut); Dr RITTMANN, Jochen (Swiss Light Source, Paul Scherrer Institut); Mr ESPOSITO, Vincent (Swiss Light Source, Paul Scherrer Institut); Dr BEAUD, Paul (Swiss Light Source, Paul Scherrer Institut); Dr INGOLD, Gerhard (Swiss Light Source, Paul Scherrer Institut); Prof. DEMSAR, Jure (Physics Department, Universität Konstanz); Prof. JOHNSON, Steven Lee (Institute for Quantum Electronics, Physics Department, ETH Zürich)

Presenter: Mr NEUGEBAUER, Martin Josef (Institute for Quantum Electronics, Physics Department, ETH Zürich)

Session Classification: Scientific Opportunities with SwissFEL

Track Classification: Scientific Opportunities with SwissFEL