

Contribution ID: 2310

Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Type: Invited Speaker / Conférencier(ère) invité(e)

Atomically Resolved Dynamics of a Charge Density Wave (I)

Tuesday 12 June 2018 14:00 (30 minutes)

Advances in THz generation have enabled a wide range of new scientific tools that probe previously inaccessible dynamics in materials. In the area of scanning tunneling microscopy the capability of generating large amplitude THz pulses have enabled practical ultrafast scanning tunneling microscopy experiments. In a THz-coupled scanning tunneling microscope (THz-STM), THz pulses couple to the tip of the microscope and provide a means to modulate the electric field at the microscope's tunnel junction thus allowing ultrafast control of the tunnel current. Using a THz time domain spectrometer, THz pulses can then be used to achieve stroboscopic ultrafast time resolution in STM experiments. The operating principles of a THz-STM will be introduced along with the results of a recent experiment on charge density wave (CDW) state supported by niobium diselenide. In this experiment the response of the CDW state to strong electric field pulses was examined using a THz-STM to extract the response of individual atomic site. This allowed a measurement of the impact a single individual atomic defect has on the dynamic modes of the CDW state.

Author: BURGESS, Jacob (University of Manitoba)

Co-authors: Mr ROLF-PISSARCZYCK, Steffen (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Mr ABDO, Mohamad (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Dr MALAVOLTI, Luigi (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Mr MCMURTRIE, Greg (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure for Functional Matter and Dynamics of Matter); Dr HAENZE, Max (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Mr MCMURTRIE, Bjoern (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Dr HAENZE, Max (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Prof. LOTH, Sebastian (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Prof. LOTH, Sebastian (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Prof. LOTH, Sebastian (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Prof. LOTH, Sebastian (Institute for Functional Matter and Quantum Technologies, University of Stuttgart and The Max Planck Institute for the Structure and Dynamics of Matter); Prof. LOTH, Sebastian (Institute for the Structure and Dynamics of Matter))

Presenter: BURGESS, Jacob (University of Manitoba)

Session Classification: T3-7 Surface Sciences (DSS) I Science des surfaces (DSS)

Track Classification: Surface Science / Science des surfaces (DSS)