



SFB1242

Nichtgleichgewichtsdynamik kondensierter
Materie in der Zeitdomäne

UNIVERSITÄT
DUISBURG
ESSEN

Open-Minded

**14.11.2017 / 10 Uhr c.t., Raum MG 272
Campus Duisburg**

Nonlinear softmode dynamics studied by 2D terahertz spectroscopy and femtosecond x-ray diffraction

Dr. Michael Wörner

**Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, 12489 Berlin,
Germany**

Soft modes are a particular type of polar low-frequency lattice vibrations in crystals. They display pronounced frequency downshifts when the material approaches a structural phase transition such as in displacive ferroelectricity. The strong coupling between electronic interband and vibrational transition dipoles can strongly enhance the vibrational oscillator strength, leading to the so-called polarization catastrophe in a phase transition from the para- to the ferroelectric state of a crystal. We investigated the nonlinear response of the soft mode in aspirin crystallites using two-dimensional terahertz spectroscopy. Coherent excitation of the soft mode leads to a pronounced blue shift of the soft mode which recovers gradually with its picosecond decay. In another experiment we investigated the electronic and nuclear motions in ferroelectric ammonium sulfate using femtosecond x-ray diffraction. The soft mode oscillation is by far dominated by electronic currents rather than nuclear motions. For strong coherent excitation we observe even polarization switching.

Für diese Zeit steht eine Kinderbetreuung nach vorheriger Anmeldung zur Verfügung.

Contact: Prof. Dr. Björn Sothmann, Faculty of Physics
Phone: +49 (203) 379-1578 / Mail: bjoerns@thp.uni-due.de