

Joint CQSE and CASTS Seminar

Weekly Seminar
Sep. 14, 2012 (Friday)

TIME Sep. 14, 14:30 ~ 15:30
TITLE Ultrafast dynamics and phonon softening in $\text{Fe}_{1+y}\text{Se}_{1-x}\text{Te}_x$
single crystals
SPEAKER Prof. Chih Wei Luo
Department of Electrophysics, National Chiao Tung
University
PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

The ultrafast quasiparticle dynamics of $\text{Fe}_{1+y}\text{Se}_{1-x}\text{Te}_x$ single crystals were investigated by dual-color transient reflectivity measurements ($\Delta R/R$) from 4.3 K to 290 K. The electron-phonon coupling strength λ ($= 0.16 \sim 0.01$) and the temperature-dependent energy of longitudinal-acoustic phonons were, respectively, obtained from the relaxation time of a fast component and the period of an oscillation component in $\Delta R/R$. Such small λ demonstrates an unconventional origin of superconductivity in FeSe. Moreover, the temperature-dependent $\Delta R/R$ exhibits anomalous changes at T_c , 90 K, and 230 K, unambiguously revealing the phase transition as well as the phonon softening via magnetoelastic effect.

