Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Real-time photoinduced quasi-particle relaxation of superconductors[1] JIANMIN TAO, JIAN-XIN ZHU, Theoretical Division and CNLS, Los Alamos National Laboratory
— Ultrafast optical phenomena are of fundamental importance in the investigation of electronic dynamics of metals and superconductors [1]. By considering a model Hamiltonian with electron-boson coupling of a superconductor exposed to a time-dependent laser field, we calculate the current density, which can be expressed in terms of the quasi-particle density matrices. The time evolution of these density matrices is derived within a mean-field approximation using the equation-of-motion approach and is numerically investigated with Runge-Kutta method. we discuss the consequence of the d-wave pairing symmetry in the quasi-particle relaxation process.

[1] R. D. Averitt and A. J. Taylor, J. Phys: Condensed Matter 14, R1357 (2002).

[1]Acknowledgment: This work was supported by DOE under Contract No. DE-AC52-06NA25396 and Grant No. LDRD-PRD X9KU at LANL.

Jianmin Tao
Los Alamos National Laboratory

Date submitted: 28 Nov 2008 Electronic form version 1.4