

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Tuning non-equilibrium superconductors with lasers MICHAEL

SENTEF, HISKP, University of Bonn, ALEXANDER F. KEMPER, LBL Berkeley, ANTOINE GEORGES, Ecole Polytechnique and College de France, Paris, CORINNA KOLLATH, HISKP, University of Bonn — The study of the real-time dynamics of solids perturbed by short laser pulses is an intriguing opportunity of ultrafast materials science. Previous theoretical work on pump-probe photoemission spectroscopy revealed spectroscopic signatures of electron-boson coupling [1, 2], which are reminiscent of features observed in recent pump-probe photoemission experiments on cuprate superconductors [3, 4]. Here we investigate the ordered state of electron-boson mediated superconductors subject to laser driving using Migdal-Eliashberg theory on the Kadanoff-Baym-Keldysh contour. We extract the characteristic time scales on which the non-equilibrium superconductor reacts to the perturbation, and their relation to the coupling boson and the underlying order. [1] M. Sentef et al., Phys. Rev. X 3, 041033 (2013). [2] A. F. Kemper et al., Phys. Rev. B 90, 075126 (2014). [3] J. Graf et al., Nat. Phys. 7, 805 (2011); W. Zhang et al., Nat. Comm. 5, 4959 (2014). [4] J. D. Rameau et al., Phys. Rev. B 89, 115115 (2014).

Michael Sentef
HISKP University of Bonn

Date submitted: 12 Nov 2014

Electronic form version 1.4