358
Accession number:20114314459295
Title:Energy-gap dynamics of superconducting NbN thin films studied by time-resolved terahertz spectroscopy
Authors:Beck, M. (1); Klammer, M. (1); Lang, S. (1); Leiderer, P. (1); Kabanov, V.V. (2); Gol'Tsman, G.N. (4); Demsar, J. (1)
Author affiliation:(1) Department of Physics, Center for Applied Photonics, Univ. of Konstanz, D-78457, Germany; (2) Zukunftskolleg, Univ. of Konstanz, D-78457, Germany; (3) Complex Matter Department, Jozef Stefan Institute, SI-1000, Slovenia; (4) Moscow State Pedagogical University, Moscow, Russia
Corresponding author:Beck, M.
Source title:Physical Review Letters
Abbreviated source title:Phys Rev Lett
Volume:107
Issue:17
Issue date:October 21, 2011
Publication year:2011
Article number:177007
Language:English
ISSN:00319007
E-ISSN:10797114
CODEN:PRLTAO
Document type:Journal article (JA)
Publisher:American Physical Society, One Physics Ellipse, College Park, MD 20740-3844, United States
Abstract:Using time-domain terahertz spectroscopy we performed direct studies of the photoinduced suppression and recovery of the superconducting gap in a conventional BCS superconductor NbN. Both processes are found to be strongly temperature and excitation density dependent. The analysis of the data with the established phenomenological Rothwarf-Taylor model enabled us to determine the bare quasiparticle recombination rate, the Cooper pair-breaking rate and the electron-phonon coupling constant, $\lambda = 1.1 \pm 0.1$, which is in excellent agreement with theoretical estimates.
Number of references:36