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Accession number:12960370
Title:Observation of coherent acoustic phonons and magnons in an antiferromagnet NiO
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Source title:Physical Review B (Condensed Matter and Materials Physics)
Abbreviated source title:Phys. Rev. B, Condens. Matter Mater. Phys. (USA)
Volume:86
Issue:9
Publication date:1 Sept. 2012
Pages:094301 (4 pp.)
Language:English
ISSN:1098-0121
CODEN:PRBMDO
Document type:Journal article (JA)
Publisher:American Physical Society
Country of publication:USA
Material Identity Number:DQ91-2012-036
Abstract:Ultrafast lattice and spin dynamics in an antiferromagnet NiO were studied via reflection and transmission experiments using polarization spectroscopy along with the pump-probe technique. The damped oscillations observed in the reflection experiment are not of spin origin but can be attributed to an interference effect caused by the probe pulse reflected by a propagating wave packet of acoustic phonons. Terahertz oscillations of coherent magnons were observed in the transmission experiment. Three antiferromagnetic modes were observed at low temperatures. As the temperature increases, the two higher modes degenerate above ~250 K and then soften toward the Ne´el temperature (523 K).
Number of references:18
Inspec controlled terms:antiferromagnetic materials - high-speed optical techniques - magnons - Neel temperature - nickel compounds - phonons - Raman spectra - spin dynamics
Uncontrolled terms:coherent acoustic phonons - ultrafast lattice dynamics - spin dynamics - reflection experiments - transmission experiments - polarization spectroscopy - pump-probe technique - damped oscillations - propagating wave packet - terahertz oscillations - coherent magnons - antiferromagnetic modes - Neel temperature - NiO
Inspec classification codes:A6320D Phonon states and bands, normal modes, and phonon dispersion - A7530D Spin waves in magnetically ordered materials - A7530K Magnetic phase boundaries - A7540G Dynamic properties of magnetic materials - A7550E Antiferromagnetics - A7830G Infrared and Raman spectra in inorganic crystals - A7847 Ultrafast optical measurements in condensed matter
Chemical indexing:NiO/bin Ni/bin O/bin
Treatment:Experimental (EXP)
Discipline:Physics (A)
DOI:10.1103/PhysRevB.86.094301
Database:Inspec