664.
标题: Metamaterial near-field sensor for deep-subwavelength thickness measurements and sensitive refractometry in the terahertz frequency range
作者: Reinhard, B (Reinhard, Benjamin); Schmitt, KM (Schmitt, Klemens M.); Wollrab, V (Wollrab, Viktoria); Neu, J (Neu, Jens); Beigang, R (Beigang, Rene); Rahm, M (Rahm, Marco)
来源出版物: APPLIED PHYSICS LETTERS 卷: 100 期: 22 文献号: 221101 DOI: 10.1063/1.4722801 出版年: MAY 28 2012
在 Web of Science 中的被引频次: 0
被引频次合计: 0
引用的参考文献数: 26
摘要: We present a metamaterial-based terahertz (THz) sensor for thickness measurements of subwavelength-thin materials and refractometry of liquids and liquid mixtures. The sensor operates in reflection geometry and exploits the frequency shift of a sharp Fano resonance minimum in the presence of dielectric materials. We obtained a minimum thickness resolution of 12.5 nm (1/16 000 times the wavelength of the THz radiation) and a refractive index sensitivity of 0.43 THz per refractive index unit. We support the experimental results by an analytical model that describes the dependence of the resonance frequency on the sample material thickness and the refractive index. (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.4722801]
入藏号: WOS:000304823800001
语种: English
文献类型: Article
KeyWords Plus: TIME-DOMAIN SPECTROSCOPY; WATER
地址: [Reinhard, Benjamin; Schmitt, Klemens M.; Wollrab, Viktoria; Neu, Jens; Beigang, Rene; Rahm, Marco] Univ Kaiserslautern, Dept Phys, D-67663 Kaiserslautern, Germany
[Reinhard, Benjamin; Schmitt, Klemens M.; Wollrab, Viktoria; Neu, Jens; Beigang, Rene; Rahm, Marco] Univ Kaiserslautern, Res Ctr OPTIMAS, D-67663 Kaiserslautern, Germany
[Wollrab, Viktoria; Beigang, Rene; Rahm, Marco] Fraunhofer Inst Phys Measurement Tech IPM, D-79110 Freiburg, Germany
通讯作者地址: Reinhard, B (通讯作者),Univ Kaiserslautern, Dept Phys, D-67663 Kaiserslautern, Germany
电子邮件地址: breinhard@physik.uni-kl.de
出版商: AMER INST PHYSICS
出版商地址: CIRCULATION & FULFILLMENT DIV, 2 HUNTINGTON QUADRANGLE, STE 1 N O 1, MELVILLE, NY 11747-4501 USA
Web of Science 分类: Physics, Applied
学科类别: Physics
IDS 号: 952WC
ISSN: 0003-6951
29 字符的来源出版物名称缩写: APPL PHYS LETT
ISO 来源出版物缩写: Appl. Phys. Lett.
来源出版物页码计数: 4