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标题: Interpretation of transmission through type II superconducting thin film on dielectric substrate as observed by laser thermal spectroscopy
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摘要: We provide a thorough analysis of THz properties of BCS-like superconducting thin films. Temperature and frequency dependence of complex conductivity in zero magnetic field is discussed by utilizing the Zimmerman et al. explicit BCS based formula [Physica C 183 (1991) 99]. We extend this approach by employing the effective medium theory and develop a phenomenological model capable of accounting for the influence of external magnetic field. Using Yeh powerful formalism [Surface Sci. 96 (1980) 41] we calculate optical transmission of linearly polarized laser beam normally incident to a multilayered sample consisting of a thin NbN film grown on birefringent sapphire substrate, entirely covering ranges of interest in temperature and frequency. A proposal to exploit linear polarization of the incident beam parallel with principal axes of conductivity tensor is explained and theoretical predictions for a realistic NbN sample are computed and discussed. (C) 2012 Elsevier B. V. All rights reserved.

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