

Optical Response of Metal-Dielectric Composite Containing Interfacial Layers

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(Received: 2000-9-12; Revised:)

Abstract: A phenomenological approach to investigate the effect of interfacial layers on the absorption of metal-dielectric composite at elevated temperatures is put forward by making use of a model in which weakly nonlinear spherical metallic particles with linear concentric shells are randomly embedded in a linear host. Corresponding formulae in terms of the interfacial factor are derived in detail by incorporating Taylor expansion and Drude model. We take Ag/MgF₂ composite as numerical calculation. It is concluded that such absorption is dependent not only on the temperature, but also on the properties of interfacial layers. Many other interesting phenomena are shown.

PACS: 78.20.Dj, 77.22.Ch, 78.66.Sq

Key words: optical properties, temperature dependence, electron-electron interactions

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