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MEENAKSHI COLLEGE FOR WOMEN
(Autonomous)

Kodambakkam, Chennai - 600024, India

BOOK OF ABSTRACTS

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Transfer matrix based analysis of optical transmission and Reflection prospects in Au/TiO₂ hyperbolic Metamaterials

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Abstract

This paper is intended to give an investigation on the switchable reflection modulation prospects of metal dielectric (Au/TiO₂) based hyperbolic metamaterial operating in mid-IR frequencies. By modulating its design via variation of the fill fraction, both the longitudinal and transverse permittivities when plotted versus wavelength show a decrease(increase) in their real(imaginary) parts. However the distinct pattern noted here is that the permittivity in case of longitudinal propagation exhibits a steeper change, whereas it's a flattening change with respect to wavelength, when there is an ascending variation of fill fraction. Further, the reflectance modulation is obtained in the IR regime with the varying fill fraction. Also, the influence of the incidence angle on the reflectance is investigated to obtain a sharp edge filter.

Keywords Hyperbolic metamaterial, Reflectance, Permittivity