

Opto-Electronics Review, 2016, volume 24, issue 2, pp. 47-57

Analysis of a metal clad waveguide sensor having metamaterial as a guiding layer

Upadhyay, A.; Prajapati, Y. K.; Tripathi, R.; Singh, V.; Saini, J. P.

DOI: <https://doi.org/10.1515/oere-2016-0009>

Abstract:

In this study a metal clad waveguide sensor with a metamaterial guiding layer is analyzed. Sensitivity of the proposed sensor is derived using dispersion and Fresnel's equations for waveguiding mode and reflection mode. While efficiently analyzing and comparing the results with the existing one, some interesting findings are achieved. It is observed that the proposed sensor shows larger cover layer sensitivity and larger adlayer sensitivity compared to the dielectric guiding layer sensor due to adsorptive properties of metamaterial. Henceforth, it concludes that the proposed sensor shows sensitivity improvement over a dielectric guiding layer sensor.