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**Optical Characteristics of the Plasmon-active Interface in the Metamaterials with Various Material Properties** DANIEL SEUNGMIN LEE, RICHARD KYUNG, CRG-NJ — In this paper, various combinations of metamaterial layers in which the surface plasmon polariton occurs were studied. While the photon enters at a certain angle and stays along the surface or interface of the materials, surface plasmon polariton is observed. Different reflectivity was observed and an effective index was found through manual calculation and the use of computer programs. For the analysis, various wavelengths of the incident cosmic rays and visible lights were applied to different composite materials: dielectrics and metals. Refractive index( $n$ ) and extinction coefficient( $k$ ) for both metals and nonmetals at certain wavelengths were used and relative permittivity of metal and nonmetal was also used for the calculation. To verify the results obtained from manual calculation, computational simulations were performed using one and multiple periods of metal and dielectric combination. When Palladium, Manganese, and Vanadium were combined with certain oxides such as Molybdenum Trioxide, Silicon Oxide and Tantalum Pentoxide, optimum angles were not found for a specific wavelength.

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