EXPERIMENTAL CHARACTERIZATION OF OPTICAL NONLOCALITY IN METAL-DIELECTRIC MULTILAYER METAMATERIAL STACK

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ABSTRACT

The optical nonlocality in metal-dielectric multilayer metamaterial stack is characterized as a function of the angle of incidence for different polarizations. The measured epsilon-near-zero wavelength shift due to optical nonlocal effects agrees with the theoretical analysis developed from the transfer-matrix method and the finite-element method simulation results. In \( \omega - k \) space, the calculated band structures and iso-frequency contours reveal the mechanism of the incident angle dependent epsilon-near-zero wavelength shift for different polarizations due to the strong optical nonlocality in the multilayer stacks.