102. Title: Zero-< n > non-Bragg gap plasmon-polariton modes and omni-reflectance in 1D metamaterial photonic superlattices

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Abstract: A theoretical study of the photonic band structure and transmission spectra for 1D periodic superlattices with an elementary cell composed of two layers of refractive indices n(a) and n(b), which may take on positive as well as negative values, has been performed within the transfer-matrix approach. The dependence on the angle of incidence of the electromagnetic wave for excitation of plasmon-polaritons as well as the properties of the < n > = 0 gap were thoroughly investigated. Results are found for the generalized conditions that must be satisfied by the ratio a/b of the layer widths of metamaterial photonic superlattices, for both transverse electric and transverse magnetic polarizations, in order to have an omnidirectional < n > = 0 gap. The present study indicates new perspectives in the design and development of future optical devices.