Abstract Submitted
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The couple between modes of planar wave guides and the evanescent fields produced in the total internal reflection.[1] RAUL GARCIA-LLAMAS, JORGE GASPAR-ARMENTA, Universidad de Sonora, RAMON MUNGUIA-ARVAYO, Posgrado en Física — The coupling between the modes of planar wave guides and the evanescent fields produced in the total internal reflection (TIR) system is studied theoretically. The planar guides are assumed as a semi-infinite inhomogeneous periodic medium (IM) with modulation only in the y-direction and period a, which is perpendicular to the propagation (z-axis) of the modes. This medium is separated by a vacuum (VA) gap, of uniform thickness d_2, from a semi-infinite homogeneous dielectric medium (HM). Then, two interfaces are found, one at z = 0 between HM/VA and other at $z = d_2$ between VA/IM. A transverse magnetic electromagnetic plane wave with wavelength λ_0, is impinging the VA/IM interface and its wave vector, in the $z - y$ plane, is doing an angle θ_i with the z-axes. The solution of the electromagnetic diffracted field in the IM is a multimodal expansion as proposed by Burckhardt [J. Opt. Soc. Am. **56** (1966) pp. 1502]. Following the approach used by Glass and Maradudin [Phys. Rev. B **29** (1984) pp. 321] a matrix equation for the amplitudes of the diffracted field is found. Numerical results of the near field intensity are presented.

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