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Interaction between a surface plasmon and surface nano-defects in thin metallic films. RAÚL GARCÍA-LLAMAS, JAVIER DURÁN-FAVELA¹, JORGE GASPAR-ARMENTA, Universidad de Sonora, JOSÉ VALENZUELA-BENAVIDES, CCMC, Universidad Nacional Autónoma de México — The intensity of the electromagnetic near-field produced by the interaction between surface plasmons and surface nano-defects on otherwise planar structure is studied theoretically. The structure is a thin metallic film bounded by glass and vacuum, the Kretschmman configuration used for the excitation of surface plasmons. Exact and perturbation solutions, until fourth order in the surface defect profile, of the reduced Rayleigh equation are found to obtain the intensity. The numerical results are calculated using a single or double Gaussian wells, and triangular shaped one. Rapid oscillations of the near field are found whose period is the inverse of two times the mode propagation constant. A Fourier Transform technique is used to reconstruct the surface defect profile from the near-field intensity obtained at constant height.

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