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Mode Matching Analysis for Negative refraction in a two dimensional Plasmonic Metamaterial SANDEEP INAMPUDI, IGOR I. SMOLYANINOV, VIKTOR A. PODOLSKIY, MULTISCLAE ELECTROMAGNETICS LABORATORY TEAM — We present a theoretical analysis of negative refraction of surface plasmons in a plasmonic metamaterial formed by the periodic PMMA array on a gold surface. We used mode matching technique to analyze the dynamics of the plasmonic mode and its non trivial coupling to the free space waves and to the other guided modes of the system. Our analysis, based on the dispersion of the effective wavevector indicates the presence of a hyperbolic dispersion relation, consistent with the negative refraction.

Sandeep Inampudi

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