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Scattering of a surface plasmon polariton beam by chains of dipole nanoparticles

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Abstract

Scattering and splitting of surface plasmon polaritons (SPPs) by a chain of strongly interacting nanoparticles located near a metal surface are numerically studied. The applied numerical model is based on the Green's function formalism and point-dipole approximation for scattering by nanoparticles. Dependencies of the splitting efficiency on the inter-particle distance in the chain and on the angle of incidence of the SPP Gaussian beam are considered. It is found that the splitting efficiency depends on the inter-particle distances especially when the angle between the SPP beam and the chain is relatively small. The role of multiple scattering in the SPP splitting by the chains of nanoparticles is also discussed. © 2008 Springer-Verlag.

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