

Terahertz surface plasmon polaritons in textured metal surfaces formed by
square arrays of metallic pillars

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Abstract

In this paper, we investigate numerically the characteristics of surface plasmon polaritons (SPPs) sustained by two-dimensional arrays of metallic pillars protruding out of planar metal surfaces at terahertz (THz) frequencies.

Various shapes of the pillars are analyzed, and it is shown that the pillar shape only has weak influence on the dispersion of spoof SPPs. However, the loss of spoof SPPs is closely dependent on the pillar shape.

It is also shown that spoof SPPs on textured surfaces with pillars can exhibit much better confinement than those on pierced surfaces with holes

Keyword : Surface plasmon polaritons, Bound modes, Terahertz, Dispersion, Subwavelength confinement, Propagation length