

Spoof surface plasmon polaritons guiding by subwavelength periodically  
corrugated metal strip

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Abstract

In this paper, we developed a new kind of microstrip line on which the spoof surface plasmon polaritons (SPPs) can propagate in the low frequency (such as microwave or terahertz regime). The metal strip is designed by introducing periodical subwavelength inward slit structure on the edge of conventional microstrip line. Numerical methods are used to analyze the dispersion relation and asymptotic frequency. Such periodically structured microstrip lines support spoof SPPs in the frequency range between 200MHz and 8GHz are verified. Compared with the quasi-TEM modes on conventional metal strip lines, the spoof SPPs can be highly localized on the surface of the structured microstrip lines, so the crosstalk between different structured microstrip lines is very weak. Therefore this new kind of periodically structured microstrip line will be of great use in the high density microwave circuits or high speed systems.

Keyword : Spoof surface plasmon polaritons , corrugated metal strip