

Crosstalk reduction between metal-strips with subwavelength periodically corrugated structure

吳俊傑, 高曜煌, 林鴻兒, 楊宗哲, D. C. Tsai, H. J. Chang, C. C. Li, 謝熈家, L. F. Shen, X. F. Zhang

Communication Engineering

Engineering

yhkao@chu.edu.tw

Abstract

A new kind of microstrip line on which the spoof surface plasmon polaritons (SPPs) can propagate at low frequencies (such as microwave or terahertz regime) is developed. The upper metal-strip is designed by introducing subwavelength periodically inward openings on the edges. Numerical methods are used to analyse the dispersion relation and the asymptotic frequency. It is verified that such periodically structured microstrip lines can support spoof SPPs in the frequency range between 200 MHz and 8 GHz. Compared with the quasi-TEM modes on conventional metal-strip lines, the spoof SPPs can be highly localised on the surface of the structured microstrip lines, so that the crosstalk between the different structured microstrip lines is very weak. Therefore this new kind of periodically structured microstrip line would be of great use in high density microwave circuits or high-speed systems.

Keyword : crosstalk, stripline periodic structure, surface plasma