Abstracts

Surface-wave band gaps and leaky modes on integrated circuit structures with planar periodic metallic elements

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In recent years, there has been significant interest in complete surface-wave elimination (meaning in all-possible directions) with the use of periodic elements in integrated circuit structures. However, leaky-waves with complex propagation constants may exist within the surface-wave bandgap zone, and these have not been taken into account previously. These leaky-waves may result in more energy loss and cross talk than the surface-wave modes. This paper presents the theory and experimental results for guided surface-wave and leaky modes on a printed circuit structure consisting of planar periodic metallic patches or dipoles over a grounded substrate. It is found that fast periodic leaky modes may exist within a surface-wave band-gap zone These leaky modes should be taken into account in circuit design.

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