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Propagation analysis of circular surface waveguides with a periodically corrugated ground plane

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Abstract

A mode-matching technique in conjunction with the Floquet theorem is proposed to analyze the propagation characteristics of periodic circular surface waveguides. The circular waveguides are coated outside with a multilayered dielectric and have a ground plane with periodic corrugation of arbitrary profile. Three different ground corrugation profiles are examined to demonstrate the influences of the corrugation shape, depth, and width, dielectric thickness, and relative permittivity on bandstop characteristics.

Key words：Circular surface waveguide; Corrugated ground plane; Floquet theorem; Mode-matching method; Periodic structure