Abstracts

A broad-band sleeve monopole integrated into parallel-plate waveguide

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In this paper, a sleeve monopole is proposed and studied theoretically and experimentally. It consists of a resonant loading and a conventional sleeve monopole vertically integrated in a parallel-plate waveguide. A modal expansion technique is used to model the induced currents over the monopole surface, and fields in the region of interest are characterized by cylindrical harmonic functions. A Fourier least-square integration is applied to find the expansion coefficients by the boundary and continuity conditions. A 5.8-GHz industrial-, scientific-, and medical-band (ISM-band) example is selected for the studies. It is found that the new monopole exhibits a large bandwidth exceeding 37% for -10-dB return loss. Calculated results are validated by the measurements.

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