Abstracts

Field Theoretical Treatment of H-Plane Waveguide Junctions with Anisotropic Medium

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A method based on the equivalence principle and cavity field expansions is presented to analyze a H-plane wave-guide junction with an anisotropic medium. Using the equivalence principle, magnetic surface currents are introduced at the imaginary boundaries chosen between the central region of the junction and the waveguides. The electric displacement D in the junction can be completely expressed in terms of a solenoidal set. On the other hand, the magnetic induction B in the junction must be expressed in terms of a solenoid set and an irrotational set. Continuing the tangential magnetic field at the imaginary boundaries leads to a matrix equation, the unknowns of which are the amplitudes of the scattered waveguide modes. Using this method, H-plane waveguide junctions with ferrite and composite ferrite posts are considered. The numerical results are compared with previously published experimental and theoretical results. Excellent agreement has been acheived.

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