Abstracts

Single Slab Arbitrary Polarization Surface Wave Structure

R.C. Hansen. "Single Slab Arbitrary Polarization Surface Wave Structure." 1957 Transactions on Microwave Theory and Techniques 5.2 (Apr. 1957 [T-MTT]): 115-120.

A single grounded dielectric slab can support either TM or TE modes, but cannot propagate both with the same velocity. This paper concerns a modification of the single slab which enables either polarization to propagate with the same velocity. Such a structure could transmit a circularly polarized wave, and would be useful in transmission, feeder, and antenna applications. The structure consists of a grounded dielectric slab with parallel metal plates imbedded in the dielectric, normal to and in contact with the ground plane. The plates do not reach the top of the slab. Propagation is along the plates, whereas corrugated surfaces propagate across the vanes. For small plate thickness, the TE field is undisturbed; hence, the entire slab thickness controls the velocity. The TM field, however, has an electric field component parallel to the plates, which is shorted out by the plates; thus, only the thickness of slab above the plates controls this mode, and the two modes can be independently controlled.

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