Abstracts

Launching Efficiency of the HE/sub 11/, Surface-Wave Mode on a Dielectric Tube

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A theoretical investigation into the launching of dipolar surface waves on a dielectric tube is presented. The source under consideration is a transversely oriented point electric dipole situated on the axis of the tube. It is found that the source excites only the dominant HE/sub 11/ mode when the outer radius of the tube is sufficiently small. Phase and group characteristics as well as some field distributions are given for the source-free case; however, these are independent of the choice of the source, and are dependent only on the particular mode being excited. Surface-wave as well as radiated powers are obtained in terms of the current in the source dipole, and the launching efficiency of the surface waves is determined as a function of the tube radius, wall thickness, and permittivity of the material. Finally, comparisons are made between the dielectric tube and the solid rod which was investigated previously as possible surface-wave transmission lines, and also the launching efficiencies for these two cases.

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