Abstracts

Modal Inversion in Circular Waveguides -- Part I: Theory and Phenomenology

G.N. Tsandoulas and W.J. Ince. "Modal Inversion in Circular Waveguides -- Part I: Theory and Phenomenology." 1971 Transactions on Microwave Theory and Techniques 19.4 (Apr. 1971 [T-MTT]): 386-392.

Part I of this work investigates the phenomenon of mode reordering in circular waveguides containing one or more dielectrics. Specifically, conditions are established, be they ranges of dimensions, dielectric constants, or frequency, under which the sequence, TM/sub 01/, TE/sub 01/, TE/sub 11/, and TE/sub 21/ is obtained instead of the conventional TE/sub 11/, TM/sub 01/, TE/sub 21/, and TE/sub 01/. The desired effect is the reversal of the order of propagation between the normally dominant TE/sub 11/ mode and the circularly symmetric low-loss TE/sub 01/. Bandwidth regimes are drawn and the credibility of the dielectric model is examined and found to be satisfactory for the application of the phenomenon to the design of digital ferrite phase shifters operating in the TE/sub 01/ mode.

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