Abstracts

Dispersion Characteristics of Twisted Rectangular Waveguides

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Based on the expressions for the dominant hybrid-mode fields in twisted rectangular waveguides, dispersion formulas with two perturbational factors have been derived theoretically. These factors correspond to the two effects of the twist on the dominant wave propagation, respectively. The one expresses a shift in the cutoff frequency while the other expresses the effect of elongation in the transmission path. A set of 20-cm-long waveguides twisted uniformly by various multiples of 90° has been manufactured by the method of electroforming. The resonant frequencies of the respective waveguides have been measured as a transmission cavity in the 10-GHz band to obtain dispersion relations. Experimental results are found to be in good agreement with the theoretically derived formulas. The results of Lewin's theory are also compared with the present ones.

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