Abstracts

Diffraction Loss in Dielectric-Filled Fabry-Perot Interferometers (Short Papers)

P.F. Goldsmith. "Diffraction Loss in Dielectric-Filled Fabry-Perot Interferometers (Short Papers)." 1982 Transactions on Microwave Theory and Techniques 30.5 (May 1982 [T-MTT]): 820-823.

We analyze the transmission of dielectric-filled Fabry-Perot interferometers excited by a spherical wave having a Gaussian amplitude distribution transverse to the axis of propagation. The loss due to diffraction experienced by the incident mode is found to be reduced by a factor >= n/sup 4/ when n, the index of refraction of the dielectric, is significantly greater than unity, thus permitting such devices to be used with low loss in beams of considerably angular divergence than possible with air-filled interferometers. Measurements at 3-mm wavelength of devices made of quartz and sapphire are presented, which are in good agreement with theoretical calculations.

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