Abstracts

A Light Beam Waveguide Using Hyperbolic-Type Gas Lenses (Dec. 1966 [T-MTT])

Y. Suematsu, K. Iga and S. Ito. "A Light Beam Waveguide Using Hyperbolic-Type Gas Lenses (Dec. 1966 [T-MTT])." 1966 Transactions on Microwave Theory and Techniques 14.12 (Dec. 1966 [T-MTT]): 657-665.

This paper is concerned with the optimum design of a light beam waveguide constructed with a proposed lens-like medium, namely, a hyperbolic-type gas lens which has a hyperbolic temperature distribution on its transverse cross section. In such a medium, the temperature distribution is ideally quadratic in the transverse directions, and so the mode conversion due to the higher order variation of the dielectric constant can be minimized. Moreover, this guide has the following merits; the design procedure is simple, the mode matching at the input part is easy, and it is possible to construct a waveguide using ordinary air as the lens medium. And this consideration can be easily extended to the guide with curved configuration. It was shown that the experimental convergency of this gas lens was in agreement with the theoretical one.

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