Abstracts

Measurements on a Thermal Gradient Gas Lens (Nov. 1965 [T-MTT])

W.H. Steier. "Measurements on a Thermal Gradient Gas Lens (Nov. 1965 [T-MTT])." 1965 Transactions on Microwave Theory and Techniques 13.6 (Nov. 1965 [T-MTT]): 740-748.

If a cool gas is gently blown through a hot tube, the temperature distribution within the tube is such to make a positive optical lens which has no surfaces for scattering and reflection. These thermal gas lenses are of interest for long-distance optical transmission. In this paper the temperature distributions inside the tube and the optical properties of these lenses have been studied in detail. The temperature distributions inside a 0.250-inch ID heated tube were measured with a small thermocouple probe. The results agree with theory except for the gravity effect which displaces the coldest point below the center of the tube. The optical properties of a 0.250-inch ID 17.8 Å. The temperature profiles, paraxial focal distances, and aberration coefficients have been measured under a variety of experimental conditions.

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