Abstracts

A Theoretical Study of Light Beams Guided Along Tapered Lenslike Media, and Their Applications

S. Sawa. "A Theoretical Study of Light Beams Guided Along Tapered Lenslike Media, and Their Applications." 1976 Transactions on Microwave Theory and Techniques 24.2 (Feb. 1976 [T-MTT]): 77-93.

Propagation behavior of light beams along the tapered lenslike media, in which both the focusing parameter and the on-axis permittivity have gradients in the axial direction, is investigated in detail, theoretically and numerically, with the help of the approximate wave theory. As a result, it is clarified that the tapered lenslike media can be classified into two kinds, according to the differences of the focusing property. Matched incidence conditions to eliminate the fluctuations of the light beam are also clarified. As an application of the theory, a spot-size transducer and a mode transducer for use in a circular bend of the light focusing waveguide are proposed, and the design conditions are derived. A ray-oscillation suppressor (ROS) is also proposed, and its applicability to some new optical circuit components is discussed.

❑ Return to main document.