Abstracts

Gaussian Beam Optical Systems with High Gain or High Loss Media

Coherent electromagnetic wave amplifiers with non-negligible gain per wavelength are included in the Gaussian beam matrix formalism and a procedure is developed for propagating Gaussian beams in optical systems that may include unsaturated amplifiers and similar absorbers. Standard formulas for beam spotsize and radius of curvature in a uniform medium are generalized in a new way to include gain or loss. An asymmetric focal shift and a potentially infinite spotsize are predicted. These dramatic effects are interpreted physically.

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