



Kerr-induced nonlinear focal shift in presence of nonlinear absorption

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We report a theoretical formulation for the nonlinear Kerr-induced focal shift of converging lenses in a high intensity regime. A numerical relation expressing the on-axis intensity of a focused Gaussian beam is derived in the case of a nonlinearly absorbing and diffracting lens induced in a medium. The concept of an effective Fresnel number is used to provide a simple linear relationship between the focal displacement and the nonlinear phase distortions. The influence of nonlinear absorption on the sensitivity of the focal shift measurements is also discussed.

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