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Z-SCAN RESEARCH OF SILVER NANOCOMPOSITES

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**Research methodology.** The experimental data of nonlinear refraction of silver nanoparticle composites using the standard Z-scan technique have been presented in the paper. It is based on the measurement of the intensity of the focused laser beam passed through the specimen moving along the beam as the last one. Nearby the focal point, where the power density of the laser beam reaches its maximal, the transmittance of the sample increases or decreases relatively to that in linear regime depending on the sign of nonlinearity.

**Results.** Nonlinear refraction and nonlinear absorption have been measured employing standard single beam Z-scan technique. It has been found that the colloids of silver nanoparticles of various sizes possess defocusing ability. Based on the general considerations, one can conclude of the thermal lens nature of the nonlinear refraction of silver nanoparticle composites.

**Novelty.** By the results of normalized transmission investigations in Z-scan regime it has been conﬁrmed that Ag nanoparticles with the size of 14–18 nm after annealing of Li2B4O7: Ag glasses in reduced atmosphere are located in thin near-surface layer and form the so-called interface region. This interface region changes the character of nonlinear refraction of Li2B4O7: Ag glass from negative to positive, and signiﬁcantly enhances its nonlinear properties due to plasmon resonance.

**The practical significance.** Silver nanoparticle composites can be used as efﬁcient optical limiters which require high nonlinear refractive index materials.