

## Dendrimer-induced orientational optical nonlinearity of NLCs

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Light interaction with a nematic host doped with (1) carbosilane homodendrimers with light-absorbing azobenzene terminal groups and (2) carbosilane statistical codendrimers with azobenzene and aliphatic terminal groups of the second and fifth generations has been studied. It was found that all dendrimers induce a negative orientational nonlinearity, irrespective of the light-NLC interaction geometry. At equal chromophore concentration in NLC, the nonlinearity increases with the generation number increasing and is equal for homo- and statistical dendrimers.

An optical bistability of the director field was found in the NLC doped with the dendrimer of the second generation in a rather wide range of the light incidence angles (Fig. 1). The bistability shows up without external field; however the parameters of the hysteresis loop can be tuned by the external ac voltage. The phenomenon is explained by increasing the nonlinearity with the angles formed by the light field and the NLC director.

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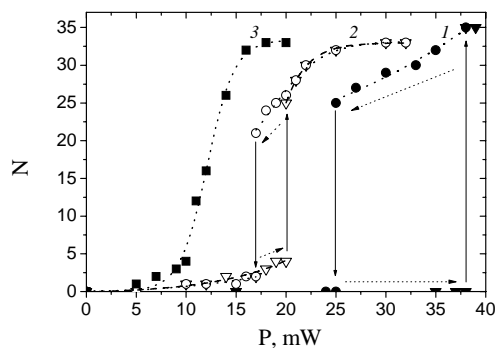


Fig. 1. Dependences of the aberration-ring number  $N$  in a light beam ( $\lambda = 473$  nm) passed through planar NLC doped with the dendrimer at increasing and decreasing the beam power  $P$  at different light incidence angles  $\alpha = (1) 0^\circ, (2) 20^\circ, (3) 30^\circ$ .