New photocrosslinking polymeric materials for liquid crystal photoalignment

U. Mahilny, A. Trofimova, A. Stankevich, A. Tolstik, A. Murauski, A. Muravsky
Physical Department, Belarusian State University, Minsk, Belarus,
e-mail: trofimova@bsu.by

The photoinduced alignment (photoalignment) of nematic liquid crystals (LC) is of great interest as a contactless technique to create patterned LC aligning layers which have good prospect as basic elements of nonlinear optical devices like controllable waveguide structures with discrete diffraction, statical and dynamical photonic media etc. LC photoalignment on the surface of benzaldehyde polymeric layer caused by photochemical reaction of benzaldehyde side groups is investigated experimentally and by numerical simulations. Arguments are offered to consider the photoalignment as based on formation of photocrosslinks involving anisotropic conjugated molecular structures.

Operation with laser radiation by using of liquid crystal elements

A.A. Kazak, A.L. Tolstik, E.A. Melnikova, A.A. Komar
Physical Department, Belarusian State University, Minsk, Belarus,
e-mail: kazakAA@bsu.by

Proposed and experimentally implemented a new method of creation the electrically controlled diffraction elements, based on a nematic liquid crystal and orienting photopolymer material. They were developed to form singular optical beams with a given topological charge and to transform the linearly polarized light beam into a beam with radial or azimuthal polarization. Also, was investigated the propagation of laser radiation in a spatially structured layers of nematic liquid crystal with an anomalously high value of birefringence and the laws of reflection of light beams at the boundary between the two mesophases were founded. The conditions for total internal reflection, waveguide propagation and polarization separation of light beams were identified.

On one time discretization scheme for SDE of special type

Anatoly Zherelo
Institute of Mathematics NAS, Minsk, Belarus

In this report the equation of the folowing form was considered

$$X_t = X_0 + \int_0^t f(X_{s-}, s)dW_s + \int_0^t \int_{\mathbb{R}} g(X_{s-}, s, v)\ \widetilde{\nu}\ (ds \times dv),$$