Diploma thesis abstract.

Generation and interaction of vector solitary waves in isotropic gyrotropic media with cubic nonlinearity.

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We numerically investigated the propagation modes of light pulses in isotropic gyrotropic media with anomalous frequency dispersion and spatial dispersion of cubic nonlinearity. It was determined that polarization characteristics have non-homogeneous distribution along the pulse. We studied the influence of light and media parameters on these distributions.

We found a separation effect of circularly polarized component of the radiation in media with relation of cubic nonlinearity tensors $\sigma_2 / \sigma_1 < 0$ and studied the mechanism of this separation.

In media with relation $\sigma_2 / \sigma_1 > 0$ we studied the process of vector soliton generation. We numerically performed collision of pulses with bell-shaped envelopes and various distributions of polarization characteristics and found interesting process of elliptically polarized pulse generation. After interaction some of them begin to spread and others become vector solitons.