PARTIAL PARITY OF FARADAY ROTATION

Adamenko D., Klymiv I., Krupych O., Vlokh O., Vlokh R.

Institute of Physical Optics, Lviv, Ukraine

E-mail: vlokh@ifo.lviv.ua

This work is devoted to the studying of the spatial dispersion effects, caused by magnetic field in magnetically non-ordered crystals CdS, $(Ga_{0.3}In_{0.7})_2Se_3$, $Bi_{12}GeO_{20}$, SiO_2 and $Li_2B_4O_7$, as well as in isotropic borosilicate glasses.

On the basis of experimental study of Faraday effect in the number of crystals it has been shown that incomplete non-reciprocity (partial parity) of this effect unambiguously is manifested only in crystals that possess natural optical activity. By the method of small-angular polarimetry deviation from no parity of Faraday rotation has been revealed in quartz crystals, which suggest that this effect does not relate to so-called magnetogyration, as well as magnetogyration is forbidden in SiO_2 crystals at utilized experimental geometry. On the basis of electrodynamic theory with accounting of spatial dispersion it is shown that partial parity of Faraday effect can exist in magnetically non-ordered crystals under the conditions of non-zero linear birefringence and existence of natural optical activity.