

STUDY OF THE MAGNETOREFRACTIVE EFFECT IN MANGANITES

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Magnetorefractive effect (MRE) is a magnetic-field-induced change in reflectivity and in transmission of light in magnetic materials. MRE may be used for contactless measurements of magnetoresistance (MR), to creation of magneto-electric sensors and modulators of light and so on. Magnetorefractive effect have been investigated in optimally doped lanthanum manganites with colossal MR effect for unpolarized light in the spectral range from 0.4 mkm to 27 mkm, in the magnetic field up to 10 kOe. It was showed that MRE in manganites is an optical response to the colossal MR effect in the IR-region. The MRE can reach tens of percent near the Curie temperature. The effect is connected with the magnetic-field-induced change of concentration of free charge carriers. In the visible range there was no direct correlation between MRE and colossal MR observed. For example, there was a change of the sign of the MRE spectra detected. The magnitude of the MRE was one order less in comparison with that in the IR-region. We suppose, the feature can be related with a redistribution of the optical density in the region of interband transitions. Supported by the programs of DPS RAS 09-T-2-1013, UD-SD of RAS 09-C-2-1016 and RFBR 10-02-00038, the youth scientific project of UD of RAS.

9.7 cm

13.4 cm

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