

APPLICATION OF MAGNETO-OPTICAL CRYSTALS FOR MECHANICAL STRESS REGISTRATION

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S u m m a r y

The theory of inverse magneto-mechanical effect in cubic crystals has been developed. The proposed model involves changes of the magnetostrictive material magnetization in the external polarizing magnetic field when creating a compression-tension or shear deformation. The magnetic field direction is shown to significantly affect the inverse magneto-mechanical effect. Using the bismuth yttrium ferrite garnet as an example, it is demonstrated that the Villari effect in combination with optical methods used to register magnetization changes enables one to measure minimum stresses at a level of 10^{-4} Pa · m for compression-tension deformations and 10^{-3} Pa · m for shear ones.