

MAGNETOOPTICAL STUDY
OF SPIN-ORIENTATION PHASE
TRANSITION IN $\text{NdFe}_3(\text{BO}_3)_4$ SINGLE CRYSTAL

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S u m m a r y

The magnetic field dependences of birefringence in a $\text{NdFe}_3(\text{BO}_3)_4$ single crystal have been measured in the case where the direction of light propagation coincides with the trigonal crystal axis C_3 ($\mathbf{k}\parallel C_3$), and the external magnetic field is oriented along the second-order axis C_2 ($\mathbf{H}\parallel C_2$). In the temperature range, in which an incommensurate phase exists with the formation of a long-period antiferromagnetic helix, the strongly pronounced jumps in the field dependence of birefringence are revealed and identified as a first-order spin-orientation phase transition. The phase transition was accompanied by a hysteresis in the field dependences of birefringence. The H - T phase diagram for a $\text{NdFe}_3(\text{BO}_3)_4$ single crystal has been plotted in the case where the magnetic field is oriented along the crystal axis C_2 ($\mathbf{H}\parallel C_2$).