

Surface magnetism of iron borate films

K. Seleznyova,^{1,2} M. Tekielak,³ A. Maziewski,³ J. Kliava,¹ S. Yagupov,² and M. Strugatsky²

¹*LOMA, UMR 5798 Université Bordeaux 1-CNRS, Talence, France*

²*Taurida National University, Simferopol, Ukraine*

³*Department of Physics of Magnetism,
Faculty of Physics, University of Białystok, Poland*

Iron borate, FeBO_3 is a two-sublattice easy-plane antiferromagnetic with a weak in-plane moment. Recently, surface magnetic anisotropy (SMA) was studied in non-basal planes of *bulk* FeBO_3 . In the present paper we have focused on the SMA in basal plane of iron borate *thin films*. Experiments were performed with a Kerr microscope in longitudinal mode. Magnetization curves were measured for different orientations of external magnetic field. Normally, FeBO_3 should possess hexagonal anisotropy in the basal plane. However, mechanical stresses can significantly modify this behavior. In the simplest case an uniaxial contribution to the magnetic anisotropy is expected. Moreover, the character of magnetization of thin near-surface layer is determined largely by domain configuration in the portion examined in the visual field of the microscope. Taking into account the influence of domain structure as suitable corrections of hexagonal and uniaxial anisotropies we have obtained a satisfactory fit to the observed angular dependence of saturation field.