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Coupling Mechanism of Anisotropic Interface and Bulk Magnetism in Thin Epitaxial Fe Film on AlGaAs (001) YICHUN FAN, HAIBIN ZHAO, GUNTER LUPKE, AUBREY HANBICKI, CONNIE LI, BERRY JONKER — A systematic study of the coupling mechanism of anisotropic interface and bulk magnetism in Fe/AlGaAs(001) heterostructures is carried out with different Fe film thicknesses. The uniaxial, cubic and out-of-plane anisotropy fields are determined for the interface and the bulk by time-resolved magnetization induced second harmonic generation (MSHG) and magneto-optic Kerr effect (MOKE), respectively. The experimental data show that the interface-induced uniaxial magnetic anisotropy is uniform within the first 5nm, but it decreases fast beyond this thickness. Moreover, the thickness of the Fe interface layer is estimated to be 1.7A (close to half of the Fe lattice constant), which is expected by MSHG theory.

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