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Ferromagnetic resonance (FMR) study of ultra-thin $Ga_{1-x}Mn_xAs$ films as a function of layer thickness[1] YINGYUAN ZHOU, Y.J. CHO, Z. GE, X. LIU, M. DOBROWOLSKA, J.K. FURDYNA, Department of Physics, University of Notre Dame, Notre Dame, IN 46556 — We report a detailed study of ferromagnetic resonance (FMR) in a series of $Ga_{1-x}Mn_xAs$ (x = 0.05) thin films grown on (100)GaAs substrates by low-temperature MBE. The thicknesses of the specimens ranged from 10nm to 200nm. We measured angular and temperature dependences of FMR and fitted the data to obtain the cubic and the uniaxial anisotropy parameters and g- factors for each specimen. The quality of the theoretical fitting results clearly indicates that FMR data can be reliably used to determine magnetic anisotropy parameters of $Ga_{1-x}Mn_xAs$. Our experiment indicates a strong thickness dependence of the in-plane uniaxial anisotropy field; on the other hand, the cubic anisotropy field, perpendicular uniaxial anisotropy field, and the g-factors depend on the hole concentration, but show little if any dependence on the film thickness, at least for as-grown specimens. The measurements and analysis of annealed specimens are presently underway.

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