

Abstract Submitted
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Anisotropic properties of ferromagnetic GaMnAs thin films grown on misoriented GaAs substrates KONRAD DZIATKOWSKI¹, WENG-LEE LIM, XINYU LIU, ZHIGUO GE, SHAOPING SHEN, JACEK K. FURDYNA, MALGORZATA DOBROWOLSKA, Department of Physics, University of Notre Dame — We discuss the magnetic anisotropy of ferromagnetic Ga_{0.94}Mn_{0.06}As films grown on vicinal GaAs substrates, with the growth plane tilted by a few degrees away from the (001) toward the (111)B plane. In addition to the well-known double-jump of in-plane magnetization, the planar Hall effect (PHE) measurements reveal an asymmetric shift of the Hall resistance. We suggest that this asymmetry arises from an out-of-plane component of the magnetization. In order to further understand the PHE results, we measured ferromagnetic resonance (FMR) on the same set of samples. We observe an asymmetrical and a symmetrical angular dependence of FMR for H in (110) and (1-10) planes, respectively. Note that the growth direction is tilted in the (110) plane. This effect is likely to originate from the fact that in films grown on misoriented substrates the [001] direction does not coincide with any of the principal directions of the demagnetization tensor. Both PHE and FMR results suggest that the direction of the easy axis is determined by magneto-crystalline rather than by shape anisotropy.

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