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Thin film deposition of Mn_2Ga under various growth condition MINGYANG LI, LI GAO, XIN JIANG, MAHESH SAMANT, BRIAN HUGHES, KEVIN ROCHE, IBM Almaden Research Center, CLAUDIA FELSER, University of Mainz, STUART PARKIN, IBM Almaden Research Center — The tetragonal DO_{22} phase of $Mn_{3-x}Ga$ is a ferromagnetic Heusler with perpendicular magnetic anisotropy. It has high spin polarization, high Curie temperature and low magnetic moment, and thus becomes a good candidate for spin-transfer-torque magnetic random access memory. This work reports the epitaxial growth of tetragonal Mn_2Ga thin films using sputtering method. The effect of various substrates, buffer layers, and substrate temperature on the film roughness is presented and compared. The formation of Mn_2Ga islands are observed at the beginning of growth on most buffer layers by reflection-high-energy-electron-diffraction. The smoothest film with root-mean-square roughness 0.10nm is obtained by using Pt buffer layer. The magnetic properties are also compared.

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