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Growth of Ferromagnetic Epitaxial Film of Hexagonal FeGe on (111) Ge Surface DUSHYANT KUMAR, P.C. JOSHI, Z. HOSSAIN, Indian Institute of Technology, Kanpur, R.C. BUDHANI, Indian Institute of Technology, Kanpur and National Physical Laboratory, Council of Scientific and Industrial Research (CSIR), New Delhi — The realization of semiconductors showing ferromagnetic order at easily accessible temperatures has been of interest due to their potential use in spintronic devices where long spin life times are of key interest. We have realized the growth of FeGe thin films on Ge (111) wafers using pulsed laser deposition (PLD). The stoichiometric and single phase FeGe target used in PLD chamber has been made by arc melting. A typical θ-2θ diffraction spectra performed on 40 nm thick FeGe film suggests the stabilization of β-Ni_2In ($B8_2$-type) hexagonal phase with an epitaxial orientation of (0001)FeGe ||(111)Ge and [11-20]FeGe ||[-110]Ge. SEM images shows a granular structure with the formation of very large grains of about 100 to 500 nm in lateral dimension. The magnetization vs. temperature data taken from SQUID reveal the T_C of $\sim$ 270K. Since, PLD technique makes it easier to stabilize the $B8_2$ (Ni_2In) hexagonal phase in thin FeGe films, this work opens opportunities to reinvestigate many conflicting results on various properties of the FeGe system.

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