

Abstract Submitted
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Electrical spin injection from $\text{Fe}_{1-x}\text{Ga}_x$ (001) films into AlGaAs/GaAs(001) LEDs¹ G. KIOSEOGLU, A.T. HANBICKI, O.M.J. VAN T ERVE, C.H. LI, M. OSOFSKY, S.-F. CHENG, B.T. JONKER, Naval Research Laboratory — Electron spin polarizations of 40-70% have been obtained in GaAs due to electrical injection from Fe or FeCo contacts using surface-emitting spin-LEDs. In such LEDs, since Fe has its magnetization easy axis in the substrate plane, a large magnetic field (>2.2 tesla) along the surface normal is required to saturate the magnetization out-of-plane. We have grown epitaxial films of $\text{Fe}_{1-x}\text{Ga}_x$ ($0 < x < 0.75$), a material noted for its high magnetostriction, on AlGaAs/GaAs (001) heterostructures, and summarize the structure, magnetization, spin polarization, and results for electrical spin injection into AlGaAs/GaAs. The out-of-plane saturation field and magnetization decrease rapidly with Ga content, but the point contact spin polarization remains near that of Fe for $x \leq 0.5$. Electrical spin injection from an $\text{Fe}_{0.5}\text{Ga}_{0.5}$ contact produces an electron spin polarization of 30% in the GaAs at 20 K, similar to that obtained from Fe contacts, but with out-of-plane saturation fields as low as 0.4 T. Post-annealing at low temperature increases the electron spin polarization up to 40% and it will be discussed at the meeting.

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