

Abstract Submitted
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Spin Injection From The Heusler Alloy Co₂MnGe INTO Al_{0.1}Ga_{0.9}As/GaAs Heterostructures XUYING DONG, X. LOU, C. ADELMANN, J. STRAND, P.A. CROWELL, C.J. PALMSTROM, Univ. of Minnesota, J.P. BARNES, A.K. PETFORD-LONG, Univ. of Oxford — The Heusler alloy Co₂MnGe has been predicted to be half-metallic [1]. The ability to grow Co₂MnGe epitaxially on GaAs, the predicted half-metallicity and the high Curie temperature ($\sim 900\text{K}$), make it an ideal candidate for a spin injecting contact. Co₂MnGe epitaxial films were grown by molecular beam epitaxy (MBE) on Al_xGa_{1-x}As (001) surfaces. *In-situ* and *ex-situ* structural characterization, such as RHEED, XRD and TEM, demonstrate the epitaxial single crystallinity of the films. In order to measure the spin injection, tunneling Schottky barrier contact spin-LED structures were fabricated from MBE-grown Al/Co₂MnGe(70Å)/*n*-Al_{0.1}Ga_{0.9}As/ GaAs(100Å)/*p*-Al_{0.1}Ga_{0.9}As heterostructures. The epitaxial heterostructures were processed into LED devices and the devices were operated with the Schottky contact under reverse bias and the *p-i-n* LED under forward bias. Electroluminescence was collected along the sample normal. The circular polarization of the observed electroluminescence was 14 % indicating a spin injection of 14% at 2K. The injected spin polarization at 2 K was calculated to be 27 % based on a calibration of the spin detector using Hanle effect measurements. The authors thank NSF-MRSEC, DARPA, and ONR for financial support. [1] S. Fujii, S. Sugimura, S. Ishida, and S. Asano., J. Phys.:Condens. Matter 2, 8583 (1990).

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