

Abstract Submitted
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Electron Tunneling across EuS / InAs Heterojunctions¹ R.L. KALLAHER, PENG XIONG, STEPHAN VON MOLNÁR, MARTECH / Florida State University, MARK FIELD, GERARD J. SULLIVAN, Teledyne Scientific Company — The tunneling properties of the heterojunction formed between the ferromagnetic semiconductor EuS and the non-magnetic semiconductor InAs are investigated to explore the feasibility of injecting spin polarized electrons into a two dimensional electron gas. Below the ferromagnetic transition temperature, T_c , of EuS the barrier height of the heterojunction follows a Brillouin function with $S=7/2$, demonstrating that the transport is dominated by the large, ~ 0.5 eV, Zeeman splitting of the conduction band in EuS.² At temperatures above T_c the zero-bias conductance of EuS / InAs heterojunctions show two separate regimes, each having an exponential temperature dependence, indicating that other scattering mechanisms are present in the barrier in addition to magnetic fluctuation effects seen in Schottky barriers formed between EuS and metals.³

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²J. Trbovic et al., Applied Physics Letters, 87, 82101 (2005).

³W.A. Thompson et al., Physical Review Letters, 26, 1308 (1971).

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