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Spin-filtering properties of ultra thin Eu chalcogenide films[1] MARTINA MUELLER, MARIUS COSTACHE, JAGADEESH MOODERA, Francis Bitter Magnet Lab, MIT — Promising materials for the generation of nearly fully polarized current are the magnetic semiconductors EuO and EuS when used as tunnel barriers. The spin-filter effect is due to exchange splitting of their conductance band below the ferromagnetic transition temperature, T_C. Combined with a structural and electrical compatibility with Si, Eu chalcogenides can be recognized as potential materials to study spin injection into semiconductors. In this work, special attention was drawn to the magnetic and transport properties of thin ($<$ 6nm) EuO and EuS films to explore the feasibility of their integration into spin-injection devices. We investigated the magnetic, structural and transport behavior of EuO (EuS) thin films with regard to thickness- and substrate-induced changes. The influence of reduced dimensionality on exchange splitting and spin filter efficiency was observed in transport experiments using EuO (EuS) as a tunnel barrier. "The phenomena of spin filter tunneling", J. S. Moodera, T. S. Santos and T. Nagahama, J. Phys.: Condens. Matter **18** (2007) 1–24 – A review

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