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**Studies of spin injection into thin film InSb from CoFe** YONG-JAE KIM, R.L. KALLAHER, J.J. HEREMANS, Virginia Tech — Spin-based electronics requires manipulation of spin-polarized carriers in materials. The narrow gap semiconductor InSb is a promising material for spin-based devices due to its strong spin-orbit interaction, allowing spin manipulation using electric fields. Yet, spin injection from spin-polarized electrodes into InSb has not yet been demonstrated. In order to electrically characterize spin injection and detection in InSb, we use InSb/CoFe lateral spin valve geometries studied at low temperatures and in tilted magnetic fields. The geometries are fabricated by depositing two non-epitaxial CoFe electrodes at mesoscopic separations on high-mobility InSb thin films through an insulator window. The anisotropy of the ferromagnetic electrodes provides parallel and anti-parallel configurations. We have observed two-state non-local output voltages, which are consistent with a spin injection signal. Interestingly, the switching signal is very sensitive to temperature in the range studied. The switching signal appears at low external fields due to CoFe magnetic anisotropy effects. The results are discussed in the light of the CoFe anisotropy and expected spin-coherence properties of InSb (partial support from DOE DE-FG02-08ER46532).

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