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Separating the Contributions of Spin Injection Efficiency and Spin Diffusion Length in Non Local Spin Valves[1] MIKHAIL EREKHINSKY, FELIX CASANOVA, AMOS SHARONI, IVAN K. SCHULLER, University of California, San Diego — Non Local Spin Valves (NLSV) are unique devices which permit studies of spin transport related phenomena at the nanoscale. Two important parameters determine the signal in NLSV: a) the effective polarization of injected current from the ferromagnet (FM) through the interface, and b) the spin diffusion length of the non-magnetic metal (NM). We performed a systematic study of the NLSV signal for different device lengths as a function of NM thickness, composition and temperature. By fitting the near-exponential decay of the signal with distance we can separate the effects of polarization and NM spin diffusion length. We will discuss the contributions of surface effects on NM spin diffusion length, and FM/NM interface on efficiency of injection. In addition, we show the importance of adjacent FM electrodes in a multi-terminal spintronics device.

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