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Search For Spin Seebeck effect in in situ grown thin films[1] PRIYANGA JAYATHILAKA, DUSTIN BELYEA, HILLARY KIRBY, CASEY W. MILLER, Department of Physics, University of South Florida, SPINLAB TEAM — The Spin Seebeck Effect (SSE) is a phenomenon in which the application of a temperature gradient cross a ferromagnet causes a measurable electric potential difference transverse to the gradient when a normal metal is grown onto the ferromagnet. The spin current diffusing into the normal metal is transduced to a voltage via the Inverse Spin Hall Effect. Measuring the SSE accurately is challenging due to presence of other effects, possibly including regular Seebeck effect and anomalous thermo-magnetic phenomena. Here we report on our efforts to measure the SSE in thin films of NiFe and Co, using Au and Ta as the electrodes. All samples were grown on Si/SiOx substrates by magnetron sputtering through contact masks. The mask exchange was done in situ in a chamber where the base pressure was 2.0x10-7 Torr in order to limit contamination of the interfaces. The samples were measured using a rig with a reversible temperature gradient of 15K/cm and the resultant voltage was measured at the hot and cold ends of the sample using nanovoltmeters. The voltage signal we observe is strongly correlated with the magnetic hysteresis loops measured by Magneto-Optical Kerr Effect magnetometer.

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