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Spin Seebeck Effect Measurements on Ferromagnetic Thin Films Using Micromachined Thermal Isolation Platforms
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— The newly discovered thermoelectric effect, called the spin Seebeck effect (SSE), refers to a spin imbalance generated by a thermal gradient. This spin imbalance, capable of driving a pure spin current into a contact, is detected by measuring the conversion of the spin current into a transverse voltage (V_T) via the inverse spin Hall effect. A robust theoretical treatment of the SSE has so far eluded the community at large, and more experimental data are needed to understand the underlying physics. In this talk we present V_T measurements associated with the SSE and AMR measurements for Ni, Fe, and Ni-Fe alloy thin films, along with Au as a control, made using our micromachined thermal isolation platforms. The sensitive thermal transport measurements we make using these platforms offer several advantages including concurrent measurements at hot and cold ends of the sample, equal heating of the sample ends to isolate traditional thermoelectric effects, and a large reversible thermal gradient. Additionally, the substrate thickness results in a virtually 2-D thermal platform that dramatically reduces the likelihood of thermal gradients perpendicular to the sample.

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