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Measurement of Anomalous Nernst Effect in Py/Pt and Co/Pt films SALAR SIMAIE, JI ZHANG, JESSICA GIFFORD, GEJIAN ZHAO, DONGRIN KIM, NATHANIEL VARGAS, TINGYONG CHEN, Arizona State Univ — In metallic materials, electrons diffuse differently depending on the temperature distribution. Along the temperature gradient, an e.m.f. is induced, called the Seebeck effect. In an external magnetic field, an e.m.f is induced perpendicular to the thermal gradient, which is called the Nernst effect. In magnetic materials, it is called the anomalous Nernst effect because of the magnetization, similar to the anomalous Hall effect. Recently, thermal effects in magnetic materials have attracted a great deal of attention because of their potential to generate pure spin currents using a thermal gradient, such as the spin Seebeck effect. However, unlike electric potential, the exact thermal gradient direction is experimentally difficult to control, which has already caused misinterpretation of the thermal effects in Py and Py/Pt films. In this work, we measure the anomalous Nernst effect in Co/Pt and Py/Pt films with a well-defined thermal gradient induced by two thermoelectric coolers based on the Peltier effect. Reverse of the thermal gradient results in a reversed e.m.f. The angular dependence shows the same symmetry as the anomalous Hall effect in these polycrystalline films.

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