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**Control of Ferromagnetic Relaxation in Magnetic Thin Films through Spin Seebeck Effects** LEI LU, YIYAN SUN, MICHAEL JANTZ, MINGZHONG WU, DEPARTMENT OF PHYSICS, COLORADO STATE UNIVERSITY TEAM — Since its discovery in 2008, the spin Seebeck effect has been demonstrated in thin film strips of ferromagnetic metals, semiconductors, and magnetic garnets. This presentation reports for the first time the tuning of ferromagnetic relaxation in magnetic thin films through the spin Seebeck effect. The experiments used a 4.6 $\mu$m-thick yttrium iron garnet (YIG) film capped by a 20 nm- thick platinum (Pt) layer. A temperature gradient was established across the YIG film thickness. This temperature gradient induces a spin accumulation at the YIG/Pt interface through the spin Seebeck effect. This spin accumulation in turn results in a spin current across the thickness of the Pt layer. The net effect is a torque on the magnetic moments in the YIG film. This torque can either enhance or mitigate the relaxation rate of the magnetic moments in the YIG film. The effects were demonstrated through a change in the ferromagnetic resonance linewidth of the YIG film with the temperature gradient and were confirmed by the use of different temperature gradients and samples.

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