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**Microwave emission by a spin Hall nano-oscillator**<sup>1</sup> RONGHUA LIU, WENG L. LIM, SERGEI URAZHIN, Department of Physics, Emory University, Atlanta, GA 30322 — In a recently developed class of spintronic devices, the spin Hall effect (SHE) produces a pure spin current controlling the magnetization of ferromagnets. While SHE opens possibilities for new material combinations and device geometries, it also requires innovative approaches to device engineering. We demonstrate coherent microwave generation by a spintronic nanodevice that utilizes local injection of spin current generated by SHE into an extended magnetic film to generate magnetization oscillations, and anisotropic magnetoresistance of the magnetic layer to convert the oscillations into a microwave signal. We will describe our measurements of the dependence of spectral characteristics of the oscillations on current, temperature, and magnetic field. The dependence on current was remarkably similar to the spin-valve nano-oscillators. However, the dependence on temperature was different from the traditional magnetic nano-oscillators, indicating a significant temperature dependence of both the magnetization dynamics and the SHE.

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