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Spin Pumping due to Traveling Spin Waves in Yttrium Iron Garnet Thin Films[1] PASDUNKORALE JANANTHA, YIYAN SUN, HOUCHEN CHANG, MINGZHONG WU, Colorado State University — Yttrium iron garnet (YIG) has a very small magnetic damping and thereby represents a good candidate material for the generation of spin currents. Previous work has demonstrated the use of ferromagnetic resonance (FMR) and standing spin waves in YIG thin films to produce spin currents. In a contrast, this presentation will report on spin pumping from traveling spin waves. Experiments used a micron-thick YIG strip capped by a nanometer-thick Pt layer. The YIG film was biased by an in-plane magnetic field. The spin waves pumped spin currents into the Pt layer, and the latter produced electrical voltages across the width of the Pt strip through the inverse spin Hall effect (ISHE). Two distinct modes were observed, one at a lower frequency and another at a higher frequency, which were due to the spin pumping from the traveling spin waves and FMR modes, respectively. The spin-wave pumping shows several important features. For example, it yields stronger ISHE signals and is broad-band, in comparison with the FMR pumping.

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