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Magnetization dynamics in LSMO/Pt nanowires in the presence of spin orbit torques HANKYU LEE, IGOR BARSUKOV, CHRISTOPHER SAFRANSKI, ALEJANDRO JARA, YU-JIN CHEN, University of California, Irvine, ADRIAN SWARTZ, BONGJU KIM, GLAM, Stanford Univ., HAROLD HWANG, GLAM, Stanford Univ., SLAC Nat. Accel. Lab., ILYA KRIVOROTOV, University of California, Irvine — $La_{0.7}Sr_{0.3}MnO_3$ (LSMO) possesses attractive magnetic properties for nanowire spin torque oscillators (STOs) driven by spin orbit torques: low magnetic damping, low saturation magnetization and high spin polarization. In this context, good understanding of magnetization dynamics in LSMO/Pt bilayer nanowires is important. Here, we report measurements of the spectral properties of spin-wave modes in LSMO/Pt nanowires magnetized along the two principal in-plane axes. In electrically-detected ferromagnetic resonance (FMR) we observe excitation of multiple spin wave modes, including non-aligned modes when the nanowire is magnetized perpendicular to its axis. Spectral linewidth of the FMR resonances gives quantitative information on the Gilbert damping parameter of the nanowire. In comparison to extended LSMO/Pt films, the magnetic damping in the nanowire is reduced due to the suppression of two-magnon scattering. We will present data on the effect of high bias current density applied to the wire on the frequency and linewidth of the observed spin wave resonances.

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