Abstract Submitted
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Exceptionally low magnetic damping in $Co_{0.25}Fe_{0.75}$ epitaxial films[1] AIDAN LEE, YANG CHENG, JACK BRANGHAM, SHANE WHITE, WILLIAM RUANE, SISHENG YU, P. CHRIS HAMMEL, FENGYUAN YANG, The Ohio State University — Ferromagnetic alloy Co_xFe_{1-x} has a wide range of applications in magnetic devices and spintronics due to its strong magnetization and relatively low damping. It was recently shown that polycrystalline Co_xFe_{1-x} films of various Co concentrations grown on a Cu seed layer on Si exhibit minimal magnetic damping at x=0.25 [1]. We grow both polycrystalline and epitaxial $Co_{0.25}Fe_{0.75}$ films using off-axis sputtering. The polycrystalline films show FMR linewidths of approximately 23 G at 10 GHz, comparable to the values reported in ref. 1. Remarkably, the epitaxial $Co_{0.25}Fe_{0.75}$ films grown on MgO (100) have much smaller gilbert damping, α =8x10^{-4}, and much narrower FMR linewidths, less than 10 G at 10 GHz, which are both comparable to those of high quality $Y_3Fe_5O_{12}$ films. The metallic nature of this material combined with its very low damping offers the opportunity to explore low-loss, charge-based, dynamic spin transport that cannot be achieved with an insulating ferrimagnet such as $Y_3Fe_5O_{12}$. 1. M. A. W. Schoen et. al., Nature Phys. 12, 839 (2016).

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