Abstract Submitted
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Spin pumping and Gilbert damping in atomically flat nanometric thick YIG|NM system[1] H.M. ALYAHYAEI, Material Science and Engineering Program, University of California, Riverside, CA, 92521, CHI TANG, BOWEN YANG, JING SHI, Department Physics and Astronomy, University of California, Riverside, CA, 92521 — Epitaxial nanometric thick ytrrium iron garnet (YIG) films grown on (111) and (110) gadolliun gallium garnet (GGG) substrates via PLD exhibit an atomically flat surface. This extremely flat surface with a roughness ~ 0.1 Å offers a more controlled study of the physical mechanism behind the newly observed damping in YIG|NM bilayer systems. Our bilayer systems consist of a 30 nm thick YIG film, either (111) or (110), and a non-magnetic layer, either beta-phase Ta or Pd, with thickness ranging from 0 to 20 nm. We have performed ferromagnetic resonance (FMR) experiments and observed systematic thickness dependence of the FMR linewidth. As the thickness of NM increases, the FMR linewidth increases rapidly and then slowly approaches saturation. The effect of the YIG surface on the Gilbert damping due to the magnetic proximity effect and on spin pumping in such bilayer systems will be discussed.

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H.M. Alyahyaei
Material Science and Engineering Program,
University of California, Riverside, CA, 92521

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