Current-Induced High Frequency Excitations in Py-based Nanopillars

MUSTAFA ALHAJDARWISH, IRINEL CHIORESCU, WILLIAM PRATT JR., JACK BASS, Physics Department and Center for Sensor Materials, Michigan State University, East Lansing, MI 48824 — To study how high frequency excitations induced by high current densities in ferromagnetic/non-magnetic/ferromagnetic (F/N/F) nanopillars vary with applied magnetic field \( H \) and current \( I \), we have assembled a system containing 40 GHz picoprobes, a 12 GHz spectrum analyzer, and a 40 GHz Microwave-generator-based system that can be used as a spectrum analyzer up to 40 GHz. Our first measurements, on Permalloy (Py = Ni(84)Fe(16))-based nanopillars of the form Cu(80nm)/Py(30nm)/Cu(10nm)/Py(6nm)/Cu(5nm)/Au(200nm), yielded peaks at frequencies in the range 1 to 2 GHz. We will describe how the frequencies and heights of these peaks vary with \( H \) and \( I \).

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