

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

FMR spectroscopy with very large precession cone angle in magnetic tunnel junctions TAKAHIRO MORIYAMA, XIN FAN, JOHN Q. XIAO, Department of Physics and Astronomy, University of Delaware — Unlike the small angle precession with low power microwave excitation, which has been extensively studied using conventional ferromagnetic resonance (FMR) techniques, the large angle precession involves nonlinear response of the magnetizations. Large angle ferromagnetic resonance (LA-FMR) measurements can help to understand the magnetization dynamics with high power excitation generally found in current induced spin switching and microwave assisted switching, etc. Recently we have performed magnetoresistance measurements in IrMn/FeCo/AlO_x/Permalloy (Py) magnetic tunnel junctions excited by a large power microwave [1]. Using the same structure, we electrically detected the LA-FMR of the Py by measuring the tunneling resistance in a sweeping external dc magnetic field. We found that the resonance frequency depends on the microwave power, i.e. precession cone angle, as well as the dc magnetic field, which can be well explained by using the Landau-Lifshitz-Gilbert equation in non-linear regime. The results also suggest that this new experimental technique to detect FMR is very useful for characterizing the LA-FMR.

[1] T. Moriyama et al., Appl. Phys. Lett. 90 (15), 152503 (2007).

Takahiro Moriyama
University of Delaware

Date submitted: 19 Dec 2007

Electronic form version 1.4