Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Micro-Structured Ferromagnetic Tubes for Spin Wave Excitation
ALEXANDER KOZHANOV, DANIEL OUELLETTE, MARK RODWELL, University of California Santa Barbara, DOK WON LEE, SHAN X. WANG, Stanford University, S. JAMES ALLEN, University of California Santa Barbara — Small scale magnetostatic spin wave devices are potentially important for on-chip filters for communication systems and spin wave logic devices. Low efficient coupling the electronic signals into the spin waves as well as coupling-out makes it difficult to build logical circuits especially when structures are scaled down to nanometer sizes. In this work we study the effect of external biasing magnetic field on the propagation of backward volume magnetostatic spin waves (BVMSW) in ferromagnetic CoTaZr stripe with micron sized ferromagnetic tubes fabricated at the ends. Spin waves are excited by shorted coplanar waveguides signal line of which is placed inside the tubes. Ferromagnetic tubes placed at the ends of the stripe form closed magnetic circuit that traps the RF magnetic field produced by the coupling loop. Transmission S-parameters of fabricated structures were measured using a vector network analyzer in the frequency range (0.5-20) GHz and biasing magnetic fields (0-1000) Oe. Experimental data is analyzed with use of theoretical model for BVMSW in ferromagnetic stripe. This work is supported by the Nanoelectronics Research Initiative (NRI) - Western Institute of Nanoelectronics (WIN).

Alexander Kozhanov
University of California Santa Barbara

Date submitted: 28 Dec 2010 Electronic form version 1.4