

Abstract Submitted  
for the TSS10 Meeting of  
The American Physical Society

**Radiation of spin waves from the open end of a microscopic magnetic-film waveguide**<sup>1</sup> DANIEL BIRT, Texas Materials Institute, University of Texas at Austin, VLADISLAV DEMIDOV, SERGEJ DEMOKRITOV, Institute for Applied Physics, University of Muenster, BRIAN O’GORMAN, MAXIM TSOI, XIAOQIN LI, Department of Physics, University of Texas at Austin — We have studied experimentally the radiation of spin waves from a permalloy-film microwaveguide into a continuous permalloy film. We show that due to a strong mismatch of the spin-wave spectrum caused by a variation in the demagnetizing field at the interface between the waveguide and the film, a frequency interval exists, where spin waves experience total reflection from the junction penetrating into the permalloy film in a tunnelinglike manner. At frequencies above this interval, complex frequency-dependent radiation patterns were observed characterized by a preferential radiation direction appearing due to the intrinsic anisotropy of the spin-wave dispersion characteristics in the film.

<sup>1</sup>The work in Muenster was supported in part by the Deutsche Forschungsgemeinschaft. The work in Texas was supported in part by the following agencies: AFOSR, Texas ARP, NSF-IGERT , and Alfred P. Sloan.

Daniel Birt  
Texas Materials Institute, University of Texas at Austin

Date submitted: 23 Feb 2010

Electronic form version 1.4