

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Energy distributions of defects causing barrier-resistance noise in CoFeB/MgO/CoFeB tunnel junctions**<sup>1</sup> RYAN STEARRETT, XIAOMING KOU, JOHN XIAO, ED NOWAK, University of Delaware — Magnetic tunnel junction devices, such as field sensors, are well known to exhibit low frequency resistance noise having a  $1/f$  spectrum. This noise has its origins in a combination of electrical and magnetic mechanisms. Previously, we have shown that the resistance noise can be reduced significantly through thermal annealing. Here, we report on the energy distribution of the defects causing tunnel-barrier-resistance noise. The distributions are determined from a Dutta-Horn model for thermally activated charge trapping and detrapping kinetics. We also discuss how the distribution changes as a function of annealing time and its relation to the current-voltage characteristics and the voltage bias dependence of the  $1/f$  noise.

<sup>1</sup>Supported by DOE under Award No. DE-FG02-07ER46374.

Edmund Nowak  
University of Delaware

Date submitted: 27 Nov 2010

Electronic form version 1.4