

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Combinatorial Exploration of Magnetostriction of  $\text{Fe}_{1-x-y}\text{Ga}_x\text{M}_y$  Ternary Alloys**<sup>1</sup> JASON HATTRICK-SIMPERS, KYU SUNG JANG, University of Maryland, SAMUEL E. LOFLAND, Rowan University, NOBLE WOO, BRUCE VAN DOVER, Cornell University, MANFRED WUTTIG, ICHIRO TAKEUCHI, University of Maryland —  $\text{Fe}_{80}\text{Ga}_{20}$  is a well known magnetostrictive material, which owes its large magnetostriction to a tetragonal distortion of the Fe lattice from a local ordering of Ga clusters. Here we will report on the synthesis and characterization of thin film combinatorial Fe-Ga-Pd and Fe-Ga-Al ternary spread samples. The composition spread samples were synthesized in an ultra high vacuum ( $10^{-9}$  Torr) co-sputtering chamber. Magnetic properties were mapped through the use of a room temperature scanning SQUID and a high throughput magneto optical kerr effect (MOKE) system. Magnetostrictive measurements were performed on micromachined cantilever libraries at room temperature. The correlation between magnetic and magnetostrictive properties across the composition phase diagram of the two systems will be discussed.

<sup>1</sup>This work was supported by ONR-MURI-N000140610530

Jason Hatrick-Simpers  
University of Maryland

Date submitted: 20 Nov 2006

Electronic form version 1.4