Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Current driven domain wall motion in ferrimagnetic Heusler thin racetracks PANAGIOTIS FILIPPOU, JAEWOO JEONG, SEE-HUN YANG, YARI FERRANTE, TEYA TOPURIA, MAHESH SAMANT, STUART PARKIN, IBM Almaden Res Ctr — Heusler compounds are a large family of materials with a wide range of tunable properties. Of particular interest are ferrimagnetic binary Heusler compounds that have low magnetization and high perpendicular magnetic anisotropy in their tetragonally distorted forms. We have investigated a number of binary Mn based Heusler compounds and have prepared ultrathin films with thicknesses ranging from 1 to several unit cells. By forming racetracks from these materials we have demonstrated, for the first time, the current induced motion of domain walls with speeds up to 106 m/sec. We discuss the mechanisms by which the domain walls are moved with current which we find is surprisingly complex. Ferrimagnetic Heuslers are particularly interesting for spintronic applications because their low moment and high anisotropy allow for very narrow domain walls and, therefore, dense applications. We estimate the domain wall widths are of the order of a few unit cells.

Panagiotis Filippou
IBM Almaden Res Ctr

Date submitted: 11 Nov 2016 Electronic form version 1.4