Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Magnetic Anisotropy Induced by Deposition Angle MICHAEL UMLOR, TIMOTHY CARRIER, University of Wisconsin Oshkosh — A series of 30 Å cobalt thin films were prepared in an ultra-high vacuum chamber using a high energy electron bombardment evaporation source. The deposition angle between the incoming adatom flux relative to the substrate normal was varied from 0° to 60°. The substrates used were Si (111), either hydrogen terminated or native oxide. The reflection high energy electron diffraction (RHEED) pattern was observed during the 25° deposition on hydrogen terminated Si (111) and found to decay steadily through sample growth, showing no signs of oscillations. No RHEED patterns were observable for any samples following the deposition indicating no long-range crystalline order. An ex-situ magneto-optic Kerr effect hysteresis loop tracer was used to observe the in-plane magnetic anisotropy of each sample. All samples with a deposition angle of 15° and more resulted in uni-axial anisotropy with the hard-axis found to be parallel to the deposition direction and the easy-axis perpendicular to this direction. Also, the coercivity field of the easy-axis was found to increase sharply with deposition angle above 30° from a value of 15 Gauss at normal incidence to 100 Gauss for 60° sample deposition.

Michael Umlor
University of Wisconsin Oshkosh

Date submitted: 15 Nov 2004 Electronic form version 1.4