Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Effects of TiN buffer layer on microstructure and magnetic anisotropy of FePt thin films ZHAOGUO QIU, Department of Physics, University of Texas at Arlington; School of Materials Science and Engineering, South China University of Technology, GUANGBING HAN, Department of Physics, University of Texas at Arlington, DECHANG ZENG, School of Materials Science and Engineering, South China University of Technology, J. PING LIU, Department of Physics, University of Texas at Arlington, UNIVERSITY OF TEXAS AT ARLINGTON COLLABORATION, SOUTH CHINA UNIVERSITY OF TECHNOLOGY COLLABORATION — FePt films were deposited at room temperature on TiN buffer layer followed by annealing. The effects of thickness of the TiN layer on the microstructure and magnetic properties of FePt films were investigated. It was found that TiN layer has significant effects on the magnetic anisotropy of the FePt films. The $L1_0$ phase transformation of the FePt films with TiN layer was more completely than that without a TiN layer. The FePt film with TiN (111) layer of 30nm thickness exhibited out-of-plane anisotropy and enhanced ordering parameter. When the thickness of TiN (111) layer further increased, the coercivity tended to decrease. The anisotropy gradually switched from out-of-plane to in-plane when the annealing temperature was increased to 700 degree. The in-plane coercivity was increased to 0.96 kOe when the thickness of randomly oriented TiN layer was 80nm.The high in-plane coercivity may come from the smooth surface morphology of FePt films induced by the small relaxation of internal stress of the thick TiN layer.

J. Ping Liu
Department of Physics, University of Texas at Arlington

Date submitted: 14 Nov 2014 Electronic form version 1.4