Abstract Submitted
for the 4CS20 Meeting of
The American Physical Society

Magnetic Behavior of Multilayered [Co/Pt] Thin Films AARON GENTILLON, KARINE CHESNEL, Brigham Young University — Understanding the formation of magnetic domain patterns in ferromagnetic thin films and their evolution under a magnetic field is useful for application in nanotechnologies such as magnetic storage. We are specifically studying domains patterns in multilayered [Co/Pt]_N thin films with perpendicular magnetic anisotropy (PMA). We are imaging the domain patterns via Atomic and Magnetic Force Microscopy (AFM/MFM) at remanence as well as in the presence of a magnetic field applied in-situ. The films consist of 3 nm thick Co layers and 0.7 nm thick Pt layers, with a number of repeats N, varying from 6 to 20. We are investigating how the number of layers N affects the domain size and therefore the domain density but also the degree of PMA exhibited by the films. We will show images of magnetic domain patterns collected at remanence as well as over a range of field values from about 0.10 T to 0.60 T. The data shows the evolution of the magnetic domain morphology from a maze-like state at remanence and low field values, toward a bubble state at higher field values. The bubble-like domains then disappear as the sample reaches saturation, occurring at about 1 T. When the field is released, the magnetic pattern may remain in a bubble state. This study provides with a unique view of how the thin films react to external magnetic fields and how to optimize domain density .

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Date submitted: 26 Sep 2020 Electronic form version 1.4