Maximizing the Magnetic Domain Morphologies in CoPt thin-films

CARSON RICHARDS2, KARINE CHESNEL3, Brigham Young Univ - Provo — I am doing research under Dr. Chesnel at Brigham Young University in Provo, Utah. The research involves studying the magnetic domain morphologies of CoPt thin-films ranging from 55-335 nanometers in thickness. In these CoPt multilayer thin-films, the thickness of the individual Co layers varies in the samples from 0.4 to 6 nanometers and the thickness of the individual Pt layer is 0.7 nanometers, these two layers repeat 50 times. My sample is 75 nm in total comprised of 0.8 nm thick layers of cobalt and 0.7 nm thick layers of platinum. I will present results for a Co thickness of 8 Angstroms. We used a Vibrating Sample Magnetometer (VSM) to apply a strong magnetic field looping sequence to the sample before returning to net-zero magnetization. We then used an Atomic Force Microscope (AFM) to map the magnetic domains. We repeated this process, of alternatively using the VSM and AFM, until we completed an ascending series from 0 Tesla to 9 Tesla. The densities of the magnetic domains of the individually and previously applied loops in each state were then analyzed. I am looking for the relationship between the magnitude of the previously applied magnetic field and the density of the magnetic domains in three different types of series. These are ascending vs descending vs pumping.

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