

Contribution submission to the conference Regensburg 2019

Influence of sputter conditions on domain configurations in patterned thin films — ●SUKHVINDER SINGH¹, LEON ABELMANN², HAIBIN GAO¹, and UWE HARTMANN¹ — ¹Institute of Experimental Physics, Saarland University, Saarbrücken, Germany — ²Korea Institute of Science and Technology (KIST)-Europe, Saarbrücken, Germany

Well-defined and technically relevant domain configurations are sought in patterned magnetic thin films [1,2]. We used Magnetic Force Microscopy to investigate domain configurations in square and disc shaped patterned Permalloy thin films. The films were prepared with sputter deposition by varying the Argon pressure from 1.5 micro-bar upto 30.0 micro-bar. The four domain configurations in squares and single vortex states in discs are found as the lowest energy states in the films prepared at 1.5 micro-bar Argon pressure. With the increase of the Argon pressure, higher energy complex domains are formed and irregularity in the domain configurations increases. From the magnetic and structural characterizations, an increase of the coercivity and a decrease of the film density with the increase of Argon pressure is observed. Moreover, the change in microstructure and composition of the films with the change of Argon pressure is linked to the formation of domain configurations inside the patterned samples.

[1] S. Cherifi et. al., Journal of Applied Physics, 98, 043901 (2005).

[2] J. McCord, Journal of Applied Physics, 95, 6855 (2004).

Part: MA
Type: Poster
Topic: Magnetic Recording, Sensors and other Devices
Email: s.singh@mx.uni-saarland.de