

Abstract Submitted  
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**Magnetic Property in large array cobalt antidot thin film using polymer-assisted nanosphere lithography** WEI-LI LEE, CHI-CHIH HO, YUNG-WU HSIEH, WEN-TAU JUAN, KENG-HUI LIN, Institute of Physics, Academia Sinica, Taipei, Taiwan R.O.C., INSTITUTE OF PHYSICS, ACADEMIA SINICA, TAIPEI, TAIWAN R.O.C. TEAM — We have developed a new method to prepare monolayer of close-packed nanospheres (NSs) over large area onto a substrate of any kind utilizing polymer bridging effect. The NSs packing domain can be as large as 1 cmx1 cm which is demonstrated from its diffraction pattern. It was then used as a template to fabricate series of cobalt antidot thin films with different antidot diameter ranging from 100nm to 180nm. Because of the good periodicity and less defects in our nanostructured samples, we would be able to not only qualitatively study their magnetic properties but also quantitatively. As the antidot diameter increases, the surface to bulk volume fraction increases and the surface magnetism becomes more prominent. We found a systematic increase in magnetic coercivity with the antidote diameter, while the saturation magnetization drops at large antidote diameter. Detailed analysis and their implication will be discussed.

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