

Joint CQSE and CASTS Seminar

Weekly Seminar
Oct. 5, 2012 (Friday)

TIME Oct. 5, 14:30 ~ 15:30
TITLE Size Effect in Nano-structured Thin Films Fabricated
Using A Monolayer Polymer/Nanosphere Hybrid
SPEAKER Dr. Wei-Li Lee
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Abstract

We have developed a method to prepare a large area monolayer of polymer/nanosphere hybrid at a water-air interface, which was used to fabricate large area well-ordered nano-antidot thin films. By tuning the antidot diameter, the size effect on its transport and magnetic property can be investigated quantitatively. We have fabricated series of ferromagnetic (FM) cobalt antidot thin films and also superconducting (SC) niobium antidot thin films with different antidot diameters. For FM antidot thin films, we uncovered an interesting crossover behavior in magnetization reversal process as the film size crosses over the length scale of the domain wall width. In SC antidot thin films, we observed oscillations in both magnetization and resistance with respect to a perpendicular magnetic field, which is reminiscent of the Little-Parks experiment in a thin-walled SC cylinder. Detailed size effect on the supercurrent screening will be discussed.

