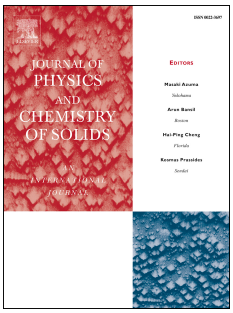
Accepted Manuscript



Monte Carlo study of magnetic behaviors in a quadrangle ferrimagnetic Ising nanoisland

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PII: S0022-3697(18)30322-6

DOI: 10.1016/j.jpcs.2018.04.027

Reference: PCS 8543

To appear in: *Journal of Physics and Chemistry of Solids*

Received Date: 8 February 2018

Revised Date: 4 April 2018

Accepted Date: 20 April 2018

Please cite this article as: Y. Yang, W. Wang, D. Lv, J.-p. Liu, Z.-y. Gao, Z.-y. Wang, Monte Carlo study of magnetic behaviors in a quadrangle ferrimagnetic Ising nanoisland, *Journal of Physics and Chemistry of Solids* (2018), doi: 10.1016/j.jpcs.2018.04.027.

Monte Carlo study of magnetic behaviors in a quadrangle ferrimagnetic Ising nanoisland

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Abstract

In this paper, using the Monte Carlo simulation, the magnetic behaviors of a ferrimagnetic mixed-spin (3/2, 5/2) nanoisland with quadrangle core-shell structure in the external magnetic field have been investigated in detail. We have discussed the influences of the anisotropies, the intralayer exchange couplings and the longitudinal magnetic field on the physical behaviors such as the magnetization, the susceptibility, the blocking temperature, the internal energy and hysteresis loops of the magnetic nanoisland. Some interesting phenomena have been observed, such as multiple saturation magnetizations and the triple hysteresis loops behavior under the effects of physical parameters. Our results are qualitatively consistent with those of some theoretical and experimental researches.

Keywords: Nanoisland, Magnetization, Susceptibility, Internal energy, Blocking temperature, Monte Carlo simulation

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