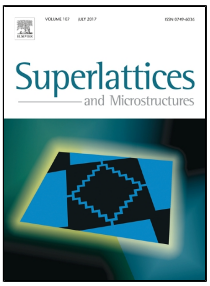
Accepted Manuscript



Magnetic properties of a cubic nanoisland in the longitudinal magnetic field：A Monte Carlo study

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PII:	S0749-6036(17)30869-8
DOI:	10.1016/j.spmi.2017.05.055
Reference:	YSPMI 5036
To appear in:	*Superlattices and Microstructures*
Received Date:	09 April 2017
Revised Date:	27 May 2017
Accepted Date:	28 May 2017

Please cite this article as: Zhou Peng, Wei Wang, Dan Lv, Rui-jia Liu, Qi Li, Magnetic properties of a cubic nanoisland in the longitudinal magnetic field：A Monte Carlo study, *Superlattices and Microstructures* (2017), doi: 10.1016/j.spmi.2017.05.055

Magnetic properties of a cubic nanoisland in the longitudinal magnetic field：A Monte Carlo study

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ABSTRACT

In this paper, the magnetic and thermodynamic behaviors of a mixed-spin ferrimagnetic cubic nanoisland, consisting of a core with spin-1 atoms surrounded by shell with spin-1 and spin-3/2 atoms in the external magnetic field have been investigated. We have used the Monte Carlo simulation to examine the effects of the crystal-field, the exchange coupling and the external magnetic field on the magnetization, susceptibility, internal energy and blocking temperature of the nanoisland. Depending on different values of the magnetic parameters, we have found various types of magnetization curves. In particular, multiple hysteresis loop behaviors such as double and triple hysteresis loops have been discovered for certain parameters.

Keywords: Nanoisland; Magnetization; Susceptibility; Internal energy; Blocking temperature; Monte Carlo

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