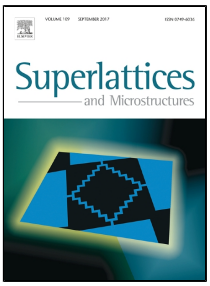
Accepted Manuscript



Monte Carlo simulation of compensation behavior for a mixed spin-5/2 and spin-7/2 Ising system with crystal field interaction

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PII:	S0749-6036(17)31641-5
DOI:	10.1016/j.spmi.2017.09.001
Reference:	YSPMI 5233
To appear in:	*Superlattices and Microstructures*
Received Date:	07 July 2017
Revised Date:	29 August 2017
Accepted Date:	02 September 2017

Please cite this article as: T. Bahlagui, H. Bouda, A. El Kenz, L. Bahmad, A. Benyoussef, Monte Carlo simulation of compensation behavior for a mixed spin-5/2 and spin-7/2 Ising system with crystal field interaction, *Superlattices and Microstructures* (2017), doi: 10.1016/j.spmi.2017.09.001

Highlights

- The total and sublattice magnetizations of the mixed spin 7/2 and 5/2 ferrimagnetic Ising model have been investigated using Monte Carlo simulations.
- The ground-state phase diagrams of the system being studied have been found.
- The influences of the exchange interactions and crystal fields on the magnetization, compensation and critical temperatures have been studied.
- We found that the system has compensation temperatures for appropriate values of J_S, J_σ in absence of any crystal field.
- We found that for each value of the next-nearest neighbors interaction J_S, there are several values of the next-nearest neighbors J_σ for which compensation temperatures exist and vice versa.
- The system cannot show compensation points for some selected values of the crystal fields Δ_S and Δ_σ only if the interactions between pairs of next–nearest neighbors J_S and J_σ are included in the system.
- We obtained different types of magnetization curves.