9.7 cm

MULTI-COMPENSATION AND TRI-CRITICAL PHENOMENA IN PERIODIC AB_1AB_2 SUPERLATTICE WITH $S = 1$

G. Wiatrowski[a], G. Bayreuther[b], and F. Bensch[b]

[a]Department of Solid State Physics, University of Łódź, Poland

[b]Institut für Angewandte Physik, Universität Regensburg, Germany

We have studied an infinite ferrimagnetic AB_1AB_2 superlattice ($S = 1$) to have direct evidence of the existence of many-compensation and tri-critical effects when a perpendicular single-ion anisotropy is considered. Previous studies have shown the possibility of existence of two (in compositionally bias-modulated TbCo films) or even more compensation points in mixed-spin systems. We present the theory of spin-1 layered structure based on the use of the exact solution for Ising linear chain in external magnetic field (linear cluster approximation-LCA). The free energy calculated from the Bogolyubov inequality allows us to describe: the II-nd as well as the I-st order phase transitions, layered and total magnetization curves. Our results (phase diagrams) indicate the existence of 1 to 4-compensation points for particular values of structure parameters: the magnetic moments, exchange couplings and single-ion anisotropy. Mainly, the role of the latter is verified thoroughly.

13.4 cm

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Corresponding author :
G. Wiatrowski

Address for correspondence :
University of Łódź
Department of Solid State Physics
Pomorska 149/153, PL-90-236 Łódź, Poland

Email address :
wiatr@krysia.uni.lodz.pl