PHASE TRANSITIONS AND COMPENSATION TEMPERATURE IN THE MIXED SPIN-1/2 AND SPIN-1 ANISOTROPIC HEISENBERG FERRIMAGNET

A. Bobák and J. Dely

Department of Theoretical Physics and Astrophysics, Faculty of Science, P.J. Šafárik University, Park Angelinum 9, 041 54 Košice, Slovak Republic

The effects of the single-ion anisotropy and the anisotropy exchange parameter on the phase transitions in the mixed spin-1/2 and spin-1 anisotropic Heisenberg ferrimagnet have been investigated by the use of an Oguchi pair approximation. Although the theory is developed for lattices with general coordination number z, the numerical calculation has been made for the system in the simple cubic ($z = 6$) and body-centered cubic ($z = 8$) lattices. In particular, we have found that the anisotropic exchange interaction has a remarkable influence on the phase diagram at low temperature. A possibility of the existence of a compensation temperature in the system at which the resultant magnetization vanishes below its transition temperature is also discussed.

This work was supported by the Science and Technology Agency (Grant No. 20-005204) and Scientific Grant Agency of Ministry of Education of Slovak Republic (Grant No.1/2009/05).

9.7 cm

13.4 cm

Subject category :

6. Theory of Magnetism

Presentation mode :

poster

Corresponding author :

A.Bobák

Address for correspondence :

Department of Theoretical Physics and Astrophysics, Faculty of Science, P.J. Šafárik University, Park Angelinum 9, 041 54 Košice, Slovak Republic

Email address :

abobak@kosice.upjs.sk