QUANTUM TRANSFER-MATRIX SIMULATIONS OF THE SEMIMETALLIC S = 1/2 ANTIFERROMAGNETIC CHAIN Yb_4As_3

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9.7 cm

Yb_4As_3 is a new compound which represents the first example of an antiferromagnetic $S = 1/2$ spin chain where the soliton nonlinear excitation can be identified [1]. The experimental results give also a strong evidence for the existence of a staggered field alternating along Yb^{3+} chains induced by the Dzyaloshinski-Moriya interaction [2]. Applying the external magnetic field H perpendicular to the magnetic chain, the $S = 1/2$ anisotropic antiferromagnetic Heisenberg model with the Dzyaloshinski-Moriya interaction can be mapped on to the isotropic Heisenberg model with both uniform field H^x and staggered field H^y. In this communication we calculate specific heat and susceptibility of the model in question by the numerical quantum transfer-matrix method and compare the results with evailable experimental findings.

[1] M. Köppen *et al.*, Phys. Rev. Lett. **82**, 22 (1999).
[2] M. Kohgi *et al.*, Phys. Rev. Lett. **86**, 11 (2001).

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