INELASTIC NEUTRON SCATTERING IN γ-Mn(12%Ge) ALLOY ABOVE AND BELOW THE NÉEL TEMPERATURE

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9.7 cm

The subject of the present investigation are the magnetic excitations different than spin waves in the γ-Mn(12%Ge) antiferromagnet. The measurements were performed by 3-axis neutron spectrometer 1T1 at ORPHEE Reactor in LLB CEA Saclay, France. The data obtained in the antiferromagnetic phase were reported earlier [1]. In the paramagnetic phase the INS was measured for energy transfers 5, 8 and 13 THz at 4 temperatures. The Lorentzian-type formula for the INS cross-section was used for data analysis. The simple hydrodynamic formula generalised for anisotropic q dependence was used for the spectral width. The obtained values of the "stiffnes constant" are of order 50 THz Å and they depend weakly on temperature in the range 1.04 - 1.25 T_N.
Some additional room temperature measurements of the inelastic neutron scattering for energy transfers below and close to the value of the energy gap in the spin wave spectrum were performed by the 3-axis spectrometer at MARIA reactor in Świerk. The results suport our earlier claims [2] that in the polydomain fct manganese alloys one can expect that neutron scattering on spin waves around magnetic Brillouin zone centre is mixed with the scattering on fluctuations at the Brillouin zone boundary.

[1] J. Jankowska-Kisielińska et al. Acta Phys. Polonica A 91 (1997) 483.
[2] K. Mikke et al. Physica B 241-243 (1998) 609.

13.4 cm

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