THE GENERALIZED SUSCEPTIBILITY OF FCC Mn(38%Ni) ALLOY AT LOW TEMPERATURES

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9.7 cm

In our earlier studies of spin dynamics in antiferromagnetic γ-Mn-Cu - γ-Mn-Fe and γ-Mn-Ni alloys the last two systems were chosen for a systematic study. The similarity of the phase diagrams was expected to lead to similar concentration dependence of both the spin wave velocities and their lifetimes. This prediction was not confirmed. In particular in the case of the fcc Mn(38%Ni) alloy we have found that unusually heavy spin wave damping takes place. The uniaxial anisotropy of the critical scattering observed in this alloy motivated the search of the anisotropy of the spin wave spectrum at low temperatures.
The measurements were performed by 3-axis neutron spectrometer 1T1 at ORPHEE Reactor in LLB CEA Saclay, France. The inelastic neutron scattering was measured in a wide energy transfer and temperature range. Here we report the low temperature data. A clear anisotropy of the neutron scattering by spin waves was obtained. A small anisotropy was found in our earlier study of magnetic excitations in the fct Mn(18%Cu) alloy, but the present data are the first evidence of an anisotropy in a system with the full crystal and magnetic cubic symmetry. The earlier conclusion that the spin waves in the Mn(38%Ni) are heavily damped is fully supported by our present data.

13.4 cm

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