TEMPERATURE DEPENDENCE OF SPIN WAVES IN FCC Mn(37%Fe,%Cu) ALLOY

K. Mikke[a] J. Jankowska-Kisielińska[a] and B. Hennion[b]
[a]Institute of Atomic Energy , Świerk, Poland
[b]Laboratoire Léon Brillouin, CEN Saclay, France

9.7 cm

Within the program of our systematic studies of magnetic excitations of manganese alloys the inelastic neutron scattering in FCC Mn(37%Fe,3%Cu) was measured at temperatures ranging from 1.7 K up to 600 K. This alloy has the FCC crystal structure both in paramagnetic and AF phase and its composition is close to the range where the enhanced itinerant behaviour was predicted by the theory. The measured spin wave velocity and the energy gap in the spin wave spectrum were reported to reach the maximum values. Our data did not confirm these earlier results. For 350 K and higher temperatures the observed dispersion relation of spin waves is not linear. In the investigated alloy the spin wave damping does increase with temperature and its q dependence is stronger than linear, as usually predicted for magnon-magnon scattering and magnon scattering on other excitations. This result is in contrast with the data for the FCT Mn(10%Fe,3%Cu) where the damping parameter was found to be temperature independent excepting the region close to T_N.

13.4 cm

Subject category :

3. Transition Metals, Alloys and Compounds

Presentation mode :
poster

Corresponding author :
K. Mikke

Address for correspondence :
Institute of Atomic Energy
Świerk, 05 400 Otwock
Poland

Email address :
e06kaz@cyf.gov.pl