

## Mapping of spin and lattice excitations in the magnetocaloric compound $\text{MnFe}_4\text{Si}_3$

*Thursday, 22 June 2017 09:00 (30 minutes)*

One way for saving energy in daily life is using the magnetocaloric effect (MCE), i.e. the change of magnetic entropy and adiabatic temperature following a change in an applied magnetic field. The ferromagnetic compound  $\text{MnFe}_4\text{Si}_3$  is a promising candidate for applications. It has a magnetic phase transition in the range of 300 K and shows a moderate MCE of 2.9 J/kg K at a reasonable magnetic field change from 0 T to 2 T. In order to understand the fundamental driving forces of the MCE in this material a study of magnetism, lattice dynamics and their interaction is necessary.

We present the results of mapping of the lattice and magnetic excitations below and above ordering temperature. The measurements have been performed at the time-of-flight spectrometer 4SEASONS at J-PARC at 7.5K and 360K. The collected data are complementary to the information on phonon and magnon dispersion obtained from triple-axis spectrometer. In particular they give us further insight in the excitation spectrum and provide more details for the map of the paramagnetic scattering above  $T_C$ .

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**Session Classification:** Parallel Session