Contribution ID: **61** Type: **Poster**

Magnetization and Magnetocaloric Effect in MnFe4Si3

Monday, 17 September 2018 17:45 (15 minutes)

The Magnetocaloric Effect forms the basis of magnetocaloric refrigeration technology, which is a novel energy efficient and environmentally friendly method for cooling [1]. MnFe4Si3 is an interesting magnetocaloric material, which features a modestly large magnetic entropy change as it contains only environmentally unproblematic and abundant elements; it has also some application relevance. Finally the structure contains different transition metal sites, which have recently been discussed as a common structural feature of many transition metal magnetocaloric materials. So a detailed study on magnetization processes is an important prerequisite in understanding this compound.
In this contribution we combine results from neutron depolarization experiments [2] carried out using Cryopad setup at single crystal diffractometer POLI at MLZ [3] with direct measurements of the adiabatic temperature change in pulsed magnetic fields using a home-built experimental set-up in HLD [4]. The results will be compared to the ones obtained from the magnetization and heat capacity measurements in static magnetic fields.

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Session Classification: Poster session 1

Track Classification: P4 Magnetism and quantum phenomena