

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Long-range antiferromagnetic interactions in Ni-Co-Mn-Ga metamagnetic Heusler alloys FABIO ORLANDI, ISIS Pulsed Neutron Facility, STFC, Rutherford Appleton Laboratory, Ditcot, UK, SIMONE FABBRICI, FRANCA ALBERTINI, IMEM-CNR, Parma, Italy, PASCAL MANUEL, DMITRY KHALYAVIN, ISIS Pulsed Neutron Facility, STFC, Rutherford Appleton Laboratory, Ditcot, UK, LARA RIGHI, Dipartimento di Chimica, Università di Parma, Parma, Italy — The quaternary Ni-Co-Mn-X (X = Ga, Sn, In and Sb) alloys have focused a considerable interest in the field of the multifunctional materials thanks to their remarkable properties, such as giant magnetocaloric and exchange-bias effect, related to an inverse magneto-structural transition. In this talk we will report on the experimental observation of a long-range antiferromagnetic structure in the metamagnetic Ni-Co-Mn-Ga Heusler alloys: a two-step process, featuring the ordering of the Ni and Mn sublattices at different temperatures, establishes the antiferromagnetic structure in martensite. The accurate magnetic symmetry analysis, based on experimental neutron diffraction, allows the determination of the correct magnetic space group of the system. The observation of such spin structure clarifies the current debate on the presence of antiferromagnetic interactions in the (Ni,Co)-Mn-X (X= Ga, Sn, Sb, In) shape memory alloys and opens new insights in the understanding of the magnetostructural properties of this relevant class of materials.

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Date submitted: 11 Nov 2016

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