MAS20-2020-000005

Abstract for an Invited Paper
for the MAS20 Meeting of
the American Physical Society

Magnetic chirality induced by chemical substitution in a chiral-polar antiferromagnet.

JUNJIE YANG, Department of Physics, New Jersey Institute of Technology

Exotic physical phenomena are bound to happen in chiral magnets, since broken space inversion, mirror symmetry and time reversal symmetry often accompany new physical phenomena. The Dzyaloshinskii Moriya (DM) interactions, allowed by the lattice chirality, could bring about a twist between the magnetic moments and lead to various chiral magnetic structures. However, chiral magnets do not necessarily exhibit chiral magnetic structures. For example, the chiral magnet Ni_3TeO_6 exhibits an achiral collinear antiferromagnetic structure below 52 K. Exploring the new methods that could turn the collinear magnetic structure into chiral magnetic structure in chiral magnets is crucial for studying the exotic chiral physics in this family of materials. Recently, we synthesized high quality single crystals of Co-substituted Ni_3TeO_6 - $NiCo_2TeO_6$. In this talk, we will discuss our recent experimental results of chiral magnet $NiCo_2TeO_6$. Our neutron diffraction experiments reveal that an incommensurate helical magnetic structure with spins aligned in the ab plane is induced by Co substitution. The results obtained from our polarized neutron diffraction experiments show clear magnetic chirality in the magnetic structure. Our results suggest that chemical substitution is an efficient method for creating chiral magnetic structures in chiral magnets.