Abstract ID : **120**

Thursday 20 Oct, 16:00

Randomness and frustration in a S = 1/2 square-lattice Heisenberg antiferromagnet

Ellen Fogh

We explore the interplay between randomness and magnetic frustration in the series of S = 1/2 Heisenberg square-lattice compounds $Sr_2CuTe_{1-x}W_xO_6$. Substituting W for Te alters the magnetic interactions dramatically, from strongly nearest-neighbor (J_1) to next-nearest-neighbor (J_2) antiferromagnetic coupling. We perform neutron scattering measurements to probe the magnetic ground state and excitations over a range of x and propose a bond-disorder model that reproduces ground states with only short-ranged spin correlations in the mixed compounds. The calculated neutron diffraction patterns and powder spectra agree well with the measured data and allow detailed predictions for future measurements. We conclude that quenched randomness plays the major role in defining the physics of $Sr_2CuTe_{1-x}W_xO_6$ with frustration being less significant.

Primary author(s) : FOGH, Ellen; MUSTONEN, Otto (Univeristy of Birmingham); BABKEVICH, Peter (École Polytechnique Fédérale de Lausanne); KATUKURI, Vamshi M. (Max Planck Institute for Solid State Research); WALKER, Helen (ISIS Neutron and Muon Source); MANGIN-THRO, Lucile (ILL); KARPPINEN, Maarit (Aalto University); WARD, Simon (ESS - DMSC); NORMAND, Bruce (Paul Scherrer Institute); RONNOW, Henrik