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Magnetic order and transitions in the spin-web compound Cu_3TeO_6

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The spin-web compound tricopper-tellurate Cu_3TeO_6 , belongs to an intriguing group of materials where the magnetism is governed by 3d9 copper $\text{Cu}(2+)$ ions. Cu_3TeO_6 has been sparsely experimentally studied and in fact only one

published investigation can be found regarding its magnetic properties. However, recently an inelastic neutron scattering (INS) study of the magnon dispersion in Cu_3TeO_6 was performed at the FOCUS time-of-flight neutron

spectrometer of PSI [Zaharko, unpublished]. Among other interesting findings in the spectrum, a large amount of diffuse scattering appears at $T > T_N$. The origin of this diffuse scattering is far from understood and at present it is not even clear if it is purely magnetically induced or not. It could possibly originate from short-range magnetic order above the transition. Here, we have used the

unique power of μSR to investigate the possible existence of short-range magnetic order above T_N for Cu_3TeO_6 . Our results show a clear long-range magnetic order below T_N as indicated by clear oscillations in the ZF spectra. At $T_N = 61.7 \text{ K}$ a very sharp transition is observed and both $w\text{TF}$ and ZF data clearly show that no magnetic order is present above T_N

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Multiple order parameter systems

Primary author: Dr MANSSON, Martin (Laboratory for Solid State Physics, ETH Zurich)

Co-authors: Dr ANDREICA, Daniel (Faculty of Physics, Babes-Bolyai University, Romania); Prof. BERGER, Helmuth (EPF Lausanne, Switzerland); Dr LUETKENS, Hubertus (LMU, PSI, Switzerland); Dr SUGIYAMA, Jun (Toyota Central Research and Development Labs. Inc., Japan); Dr PRSA, Krunoslav (Laboratory for Solid State Physics, ETH Zurich)

Presenter: Dr MANSSON, Martin (Laboratory for Solid State Physics, ETH Zurich)

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