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First Results from the Triple-axis Spectrometer at OPAL
SERGEY DANILKIN, MOHANA YETHIRAJ, THOMAS SAERBECK, FRANK KLOSE, Australian Nuclear Science and Technology Organization — The thermal triple-axis spectrometer TAIPAN is the first instrument for inelastic scattering at Australian research reactor OPAL. TAIPAN started operation in February 2009 and is in full user service since November 2010. The instrument can operate with variable incident or final energies and has a secondary spectrometer with a single detector. Presently the PG (002) double-focusing monochromator and analyzer are in use. The incident energy range on the TAIPAN is from ~ 5 meV up to ~ 100 meV with neutron flux at sample position of $\sim 10^8$ n/cm²/s [1]. First experiments were performed with superionic conductor Cu_{2-x}Se [2]. The measurements reveal a presence of soft mode in addition to the flat optic-like phonon branch. The DFT calculations show that unstable soft mode is related to ordering of Cu atoms followed by $\alpha - \beta$ phase transition at a lower temperature. The evolution of the magnetic structure with temperature in magnetically modulated FePt₃ thin film was investigated in the diffraction mode of TAIPAN. The results show that the film fabricated by modulation of the chemical order parameter consists of a magnetic FM/AFM superlattice in single-crystalline FePt₃ [3]. [1] S.A. Danilkin et al., Neutron News, 20 (2009) 37; [2] S.A. Danilkin et al., J. Phys. Soc. Jpn. 79 (2010) Suppl. A, 25; [3] T. Saerbeck et al., Phys. Rev. B 82 (2010) 134409.

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