

Recent enhancements and performance gains from upgrades to ANSTO's thermal neutron instrument TAIPAN and the triple-axis and Be-filter spectrometers

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TAIPAN is the thermal-neutron spectrometer located at the reactor face of Australia's OPAL reactor (ANSTO). TAIPAN hosts two interchangeable secondary instruments; the triple-axis spectrometer (TAS) and the beryllium-filter spectrometer. The TAS option has been operating since 2010 whilst the Be-filter only began operating in 2015. TAIPAN is renowned for its versatility and high neutron flux which has allowed the TAS to measure a broad range of samples including single crystals, powders, thin films, and co-aligned multi-crystal arrays. While the TAS option is used mostly to study structural and magnetic excitations in materials, the Be-filter option is used to measure vibrational density of states from powder samples.

TAIPAN has recently undergone some upgrades to improve the accessible momentum and energy range of both the TAS and the Be-filter spectrometers. Four key features have been modified to improve performance: the accessible momentum transfer has been increased by re-designing the enclosure; a sapphire-filter translation-stage mechanism has been installed to allow epithermal neutrons to pass to the monochromators; a new Cu-200 double-focussing monochromator has been installed to allow monochromatic scattering of neutrons up to 180 meV; and finally a new tertiary shutter and snout have been designed to improve the signal-to-noise ratio and reduced background outside the instrument enclosure. Extensive testing and alignment of all new motion stages were undertaken with reproducibility within $\pm 0.05^\circ$ or $\pm 0.25\text{mm}$ obtained for both the monochromator rotation angle & sapphire-filter alignment.

Formal Invitation Letter Required

No

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