Contribution ID : **15** Type : **Poster**

Data processing technique for the Taipan Be-filter spectrometer

Thursday, 25 November 2021 17:54 (1)

Taipan, the highest flux thermal neutron scattering instrument at ACNS, was originally built as a traditional triple-axis spectrometer. In 2016 a beryllium filter analyser spectrometer was added for increased versatility. The Be-filter acts like a low-energy band-pass filter ideal for investigating lattice dynamics and molecular vibrations over a wide energy range. It is particularly well suited to measuring the motion within materials containing light elements such as hydrogen.
We have successfully created a robust method of treating data from the Taipan filter-analyser and present the method within this poster [1]. The data-treatment process includes correction for the non-linear energy variation of a particular monochromator, removal of higher-order wavelength contamination, and estimation of low-energy multiple-scattering. The steps described here can be utilized by all users of the Australian Nuclear Science and Technology Organisation “Be-filter”—past, present, and future.

[1] G.N. Iles, K.C. Rule, V.K. Peterson, A.P.J. Stampfl and M.M. Elcombe, Rev. Sci. Instrum. 92, 073304 (2021); doi: 10.1063/5.0054786

Level of Expertise

Expert

Presenter Gender

Woman

Pronouns

Which facility did you use for your research

Australian Centre for Neutron Scattering

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Yes

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Session Classification : Poster Session

Track Classification : Instruments & Techniques