

ISIS Crystallography on TS-II: what can we do with 60 kW?

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European facilities in general and ISIS in particular are facing a major challenge from the construction of a new generation of pulsed neutron sources in the US and Japan. Although the European research community must warmly welcome these developments, it is nevertheless crucial for us to maintain a leadership role, if not in sheer flux, at least in the creative development of new neutron instruments and techniques and in the operation of a cutting edge science program.

The construction of the Target Station II at ISIS will enable us to extend pulsed neutron crystallography to cover a much wider domain of momentum transfer Q . A combination of high peak flux and state-of-the-art target, guide and instrumentation design will result in world-leading performances, in spite of the fact that the integrated power of the source is only a fraction of that at SNS and J-PARC.

The new diffractometer WISH at the ISIS TS-II will further push the envelope of low- Q crystallography. WISH is primarily designed for powder diffraction at long d -spacing on magnetic and large-unit-cell systems, with the option of enabling single-crystal and polarized beam experiments.

The conceptual design for a new single-crystal diffractometer for large molecule crystallography and structural biology will also be presented. Although the instrument design is quite different from comparable instruments at high-repetition rate sources (such as the SNS), detailed Monte Carlo simulations have shown that this machine will have excellent performances overall, and will be particularly competitive for medium-resolution crystallography on small samples.

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