Data Reduction Software Released to the Spallation Neutron Source

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The NSF-funded program DANSE: Distributed Data Analysis for Neutron Scattering Experiments has released its first software package that has been adopted by the Spallation Neutron Source. The software application, Data Reduction for Chopper Spectrometers (DRCS, or more affectionately, DrChops) is installed on the computer cluster that supports the ARCS inelastic spectrometer. DRCS has been adapted for service during commissioning of ARCS, and will be the reduction application for ARCS when it enters the user program in late 2008. DRCS will be adapted to the SEQUOIA instrument when it enters commissioning.

DRCS takes input files of neutron arrival times at detector pixels, and converts them to intensity as a function of energy and momentum transfer. Numerous capabilities are provided to account for instrument artifacts and temperature, for example, and the modular structure of the software has allowed quick production of specialized tools for instrument diagnostics and commissioning. Reduction of $10^8$ neutron events requires 40 sec on 10 processors, but the performance scales efficiently with the number of processors.

The DANSE project has produced several other software applications that are in the process of being released. Early releases of prototypes are a good way to obtain information on usage patterns and resource requirements for final products.

Doug Abernathy (ARCS instrument scientist) and Mark Loguillo (ARCS scientific associate) using the DRCS software package for examining detector signals from the ARCS spectrometer.