**Advanced visualization and quantification of neutron data**

Toby Perring1, Owen Arnold2, Michael Reuter3, Janik Zikovsky3, Alex Buts1, Martyn Gigg2, Nick Draper2

1 Rutherford Appleton Laboratory, Oxfordshire, UK

2 Tessella plc, Abingdon, Oxfordshire, UK

3 Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA

The VATES project is aimed at providing advanced tools for analysis and quantification of Neutron data. Fully understanding the materials of interest to solid state physics, chemistry and materials research, complete mapping of n-dimensional data is required. This is often comprised of dimensions in Q and energy, as a function of temperature, applied magnetic field, pressure or electric field.

The VATES project is an ongoing collaboration between ISIS at RAL and the SNS at Oakridge. The project has been run in parallel to Mantid[1], our extensible framework for neutron and muon data reduction and analysis.

The project has been heavily focused on generating n-dimensional data, and extending the Mantid suite of algorithms to operate on this new format.

Another area of development has been providing full 3D visualisation of n-dimensional providing new opportunities for data discovery and reduction. By using ParaView as the visualisation engine, we are able to provide detailed and flexible representations. Two-way interaction between ParaView[2] and Mantid allows us to view exiting data and also visually drive, Mantid, allowing us to perform tasks such as on-the-fly re-binning of data.

The project focus is now shifting towards simulation and fitting of n-dimensional data, for which we have been able to draw on expertise and proven tools from both the SNS and ISIS as well as the technology stack already implemented in the early phases of VATES.

**References**

[1] [www.mantidroject.org](http://www.mantidroject.org)

[2] [www.paraview.org](http://www.paraview.org)

Email corresponding author: toby.perring@stfc.ac.uk Preference: Oral

Key theme: High speed/real time data analysis/visualisation/3D graphics