**VATES: Software for advanced visualization and quantification of neutron scattering data**

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The VATES project aims to provide advanced tools for visualisation and fitting parameterised models to large neutron scattering data sets. Increasingly, a full understanding of the materials of interest to solid state physics, chemistry and materials research requires the complete mapping of data in an n-dimensional manifold.

VATES is an on-going collaboration between ISIS at RAL and the SNS at Oak Ridge. The project has been run in parallel to Mantid[1], our extensible framework for neutron and muon data reduction and analysis. The core of the project has been heavily focused on creating and manipulating n-dimensional data, and extending the Mantid suite of algorithms to operate on this new format.

The major user applications that have been created so far provide full 3D visualisation of manifolds within the n-dimensions, and provide new opportunities for data discovery and reduction. By using ParaView[2] as the visualisation engine, we are able to provide detailed and flexible representations of the data. Two-way interaction between ParaView and Mantid allows us to view data as it exits Mantid, and also visually drive Mantid. The use of the visualisation applications will be illustrated using examples of data from ISIS and the SNS.

The project focus is now towards supporting single-crystal elastic diffraction experiments and simulation and fitting of resolution-broadened parameterised models of n-dimensional data, for which we have drawn on expertise and proven tools from both ISIS and the SNS. The status of this part of the project will also be illustrated with examples drawn from both facilities.

**References**

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

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

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