**Advanced visualization and analysis of neutron data**

Owen Arnold1, Toby Perring2,Michael Reuter3, Alex Buts2, Martyn Gigg1, Nick Draper1

,Andrei Savici3,

1Tessella plc, Abingdon, Oxfordshire, UK

2 STFC Rutherford Appleton Laboratory, Oxfordshire, UK

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

The VATES project is a collaborative effort aimed at delivering advanced tools for visualisation and analysis of parameterised models to huge 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.

The VATES project is now developed and delivered within the Mantid[1] framework, our neutron and muon data reduction and analysis. The project receives support and addition from both ISIS at RAL and the SNS at ORNL.

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.

VATES provides new opportunities for data discovery and reduction. By using ParaView[2] as the visualisation engine, we are able to construct complex pipelines and provide detailed and flexible representations of the data. Two-way interaction between ParaView and Mantid allows us to offload processing to Mantid, in effect, visually driving it. Our Mantid framework additions have provided unexpected opportunities for new methods of visualising and processing data, such as single crystal peak integration.

We are now striving to develop better usability, better end-to-end integration, and continue to extend the tools and techniques for other facilities and scientific areas.

**References**

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

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