**ROM Tool for SOFC Modeling**

**Pacific Northwest National Laboratory**

K. Agarwal, K. Lai, and B.J. Koeppel

e-mail: jeff.stevenson@pnnl.gov Phone: (509) 372-4697

This poster will present the design and implementation of the novel reduced order model (ROM) builder toolset for SOFC models. The ROM Builder (REVEAL) is an automated framework for generating reduced order models from scientific simulations executed on any HPC platform. It is generic, portable, extensible and built with all open source technologies. REVEAL has been customized to support SOFC ROM generation, including compatibility with fuel composition sampling with constraints, running SOFC simulations on any HPC platform, identifying failed/unconverged SOFC simulations and automatic processing of I/O for ROM generation. The toolset also encompasses a range of sampling and regression methods for ROM generation, so users can select mathematical techniques best suited to their model characteristics. REVEAL is integrated with multiple data analysis tools including 2D-3D visualization, automatic quantification of ROM accuracy, prediction of model output and multiple sensitivity analysis methods. It also supports an iterative approach to add samples, along with a mechanism to export ROM for integration in system level simulations.