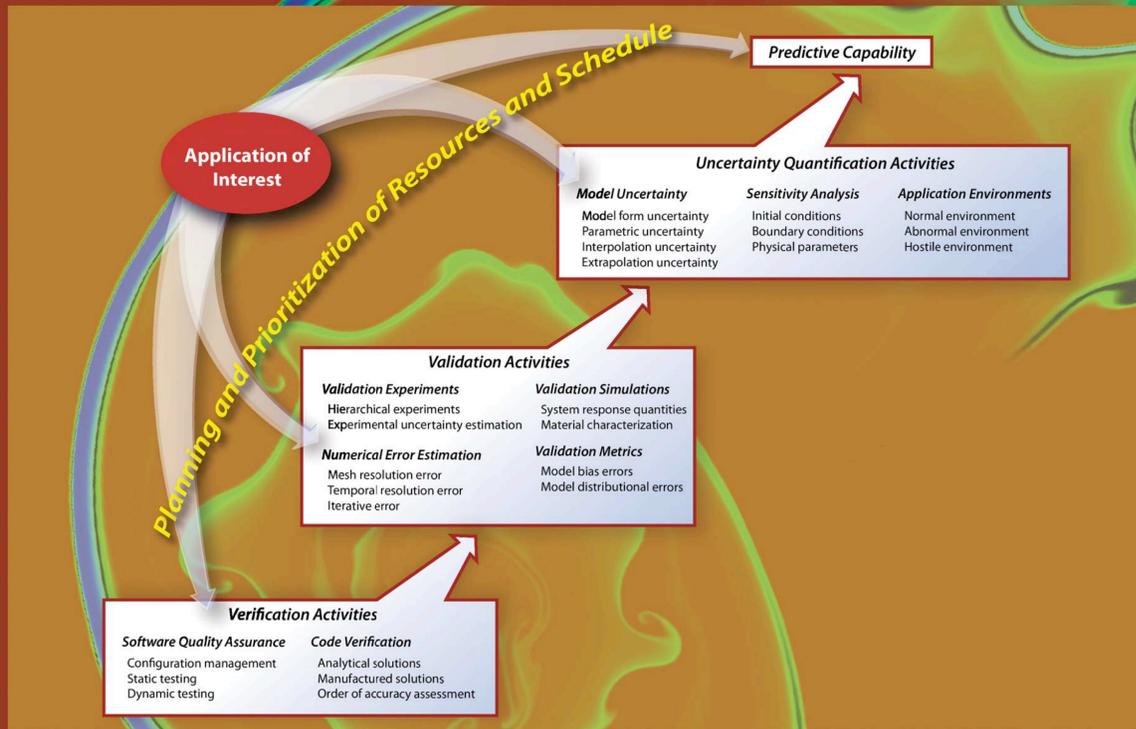




Verification and Validation



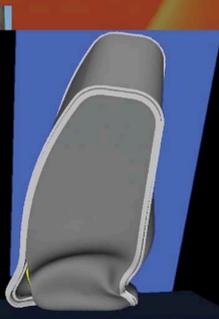
Ensuring the Credibility and Capability of Simulations

The Verification and Validation (V&V) program element of the ASC Program addresses concerns with the credibility and capability of computational simulations for the nuclear weapon stockpile. Verification activities deal with issues of software reliability and accuracy of numerical solutions to partial differential equations that describe physical processes. Validation activities deal with assessment of computational model accuracy by comparisons with experiment measurements throughout a hierarchy of physics complexity. Uncertainty quantification activities deal with procedures for representing all contributors to system uncertainty and show how these uncertainties contribute to predictions of system response for quantities of interest. All these activities contribute to predictive capability for the application of interest. Quantification of these activities must be provided to the decision makers so that computational simulations can improve design, performance assessment, and safety of high-consequence systems.

Supercomputing
Conference 2005

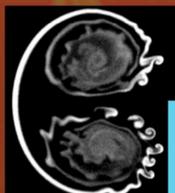


Experiment in Progress

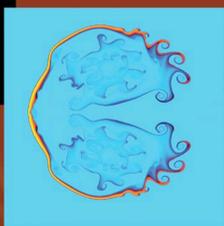


Simulation

Validation comparison for large deformation of a metal housing due to drop impact (Sandia National Laboratories).



Experiment

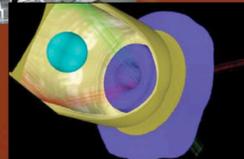


Simulation

Validation comparison for a cylinder of SF6 gas in air accelerated by a shock wave through the air (Los Alamos National Laboratory).



Experimental Facility



Simulation

National Ignition Facility target chamber and simulations to be used for validation activities for fusion experiments (Lawrence Livermore National Laboratory).

Visualize
the
Difference

