**Critical Issue: Development of Predictive Numerical Simulation Codes**

**Response of Tokamak Plasma to Nonaxisymmetric**

**Magnetic Perturbation**

* Codes require verification and validation.
  + Cross-benchmarking required for verification.
  + Dedicated machine time required to generate data for validation.
* Six codes cross-benchmarked against data from a DIII-D shot.
  + Double null shot (“stellarator-symmetric”) allows participation by full range of stellarator equilibrium codes.
  + Shot from ELM stabilization study has small nonaxisymmetric perturbation

**(),** allowing participation of tokamak perturbative equilibrium codes.

* Disagreement between VMEC and tokamak perturbative equilibrium codes: apparently due to differences in handling of localized currents near rational surfaces.
* Further progress requires comparison with experiment.
  + Dedicated set of experiments performed on DIII-D over the course of one day in May, 2014.