Discussion on FY2015 JRT

PPPL, room B318
Dec. 6th, 2013

"Impact of broadened current and pressure profiles on tokamak plasma confinement and stability"

Goals of this meeting:

- **Identify NSTX-U contributions to FY2015 JRT**
- **Provide input for DIII-D/NSTX-U research coordination meeting (Tue. 12/10)**

Agenda

- FY2015 JRT text - Podestà, 2:00-2:10pm
- Contributions from NSTX-U TSG's:
  - Advanced Scenarios & Control - Gerhardt, 2:10-3:30pm
  - Waves and Energetic Particles - Podestà, 2:30-2:50pm
  - Turbulence and Transport - Ren, 2:50-3:10pm
  - Macroscopic Stability - Berkery, 3:10-3:30pm
- Group discussion

FY2015 JRT (draft?) text

Conduct experiments and analysis to quantify the impact of broadened current and pressure profiles on tokamak plasma confinement and stability. Broadened pressure profiles generally improve global stability but can also affect transport and confinement, while broadened current profiles can have both beneficial and adverse impacts on confinement and stability.

This research will ***examine a variety of heating and current drive techniques in order to validate theoretical models of*** both the ***actuator performance and the transport and global stability response*** to varied heating and current drive deposition.

Suggested Interpretation

- Do our H&CD (and momentum) actuators operate the way we thing they should? For instance:
  - *AE physics?
  - Verification of classical beam physics otherwise?
- Given actuator performance, what is the transport response? For instance:
  - Dependence of transport on variations in q_{min}, rotation?
  - Ability to actually control q_{min} and Ω given confinement changes?
- Given actuator performance and the transport response, how can we use actuators to optimize the global stability? For instance:
  - Vertical controllability?
  - n>=1 RWM through kinetic effects?
  - core MHD through q-profile control?