Pedestal Research & Plans: PAC comments

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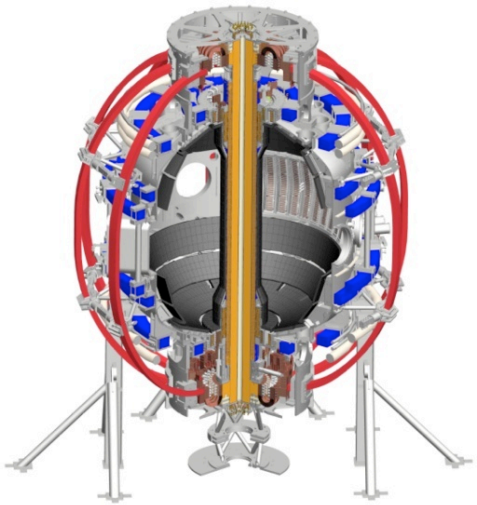

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PAC comments & responses I

- *Identify/articulate some fiducial NSTX discharges for early pedestal comparisons*
  - Aim for 1.2 MA, Bt = 0.5 T at high triangularity with 10 cm outer gap for optimum pedestal resolution to facilitate comparison with NSTX data (open to changing this)
- *Development of fundamental understanding of strong role of lithium on pedestal structure should be a high priority; more integrated model*
  - Agree. Plans are in place to study using XGC0+(suites of codes) the Er shearing and associated pedestal structures due to carbon and lithium. Another plan will be to use XGC1 for turbulence. C-S has identified one of student since it is high priority.
- *Particle transport (D and impurities) important to measure & model*
  - Agree. There is a plan to install a laser blow off system for impurity transport. As for D-particle transport in the pedestal, we need to develop techniques other than perturbative measurements since the sources/sinks at the edge are larger. As for the modeling, XGc1 has plan to address if using kinetic electrons
- *Encourage possible enhancement of pedestal-capable diagnostics; wave scattering, Er (CHERS), etc*
  - Agree for Er(CHERS) but there is no way forward with the current system. To get at Er, one can use DBS (under some assumptions). Would be nice to have high-k in the pedestal region.
- *"[...] Given the overarching nature of this goal (develop predictive capability for pedestal structure and evolution), the specific plans here could/should be better articulated/developed. What about pedestal analysis from other previously used codes, e.g., SOLPS, UEDGE, NEO, etc.?"*
  - Yes but these codes are interpretive and not predictive.

PAC comments & responses II

- *LH-transition studies plans should be articulated*
  - LH studies are not on our priority list for the first two years of operation. We will be begin to articulate a plan for studying it at the end of FY15
- *The PAC suggests that other MHD codes can calculate such ELM stability if EPED continues to have this difficulty. However, utilizing the "width" model in EPED with an ELM stability code other than ELITE might involve extra work. It would be helpful to discuss these ideas more thoroughly with EPED's developer to formulate a plan.*
  - There are ongoing efforts using MISHKA (Saarelma) and KINK (Sauter), which we plan to use to apply the EPED model to NSTX. We will also plan on contacting EPED developers.
- *Following the discussion above about particle transport and density profiles, attention needs to be focused on how snowflake divertor operation affects particle transport and density profiles. Plans should be more clearly articulated/developed.*
  - Good point. We will add an XP addressing this point.
- *For ELM ejection and divertor heat-flux modeling for experimental comparison, the possibility of using JOREK was mentioned. For ELM dynamics, consider also M3D-C1 and/or BOUT++, which should have a similar capability. For LGI ELM pacing, JOREK may have a pellet model that would be useful.*
  - In between-ELM modeling needs to be addressed using a code that has turbulence (e.g., XGC1). I also agree that there should be a linkage with heat fluxes and SOL. The ELM onset can be modeled using the codes mentioned.
  - As part of ITPA-PED, NSTX data is being analyzed using JOREK. In addition, we agree that ELM triggering by LGI can be addressed using JOREK but will require training to run JOREK.