Transport ‘n Turbulence (TNT)
NSTX-U Topical Science Group
Sep. 27, 2013

- Greg Hammett intro: NSTX-U/Theory collaboration initiative
  (Stan Kaye: other introductory comments)

- Yang Ren & Walter Guttenfelder: Description of NSTX L-mode shot 141716, measurements, existing analysis, opportunities for cross-code comparison and further study

- Brief discussions / presentations of 3 projects part of this initiative:
  - Weixing Wang: Comparative studies of NSTX-U & DIII-D on effects of collisionality
  - Ed Startsev & Stephane Ethier: adding magnetic fluctuations to GTS, eventually for microtearing
  - C.S. Chang & Seung-Hoe Ku: XGC1 applications to core plasmas, such as 141716

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- Amitava Bhattacharjee has recently outlined an initiative in NSTX-U/Theory collaborations. In discussions with Jon Menard and Stan Kaye, developed a set of projects in several areas:
  - Macroscopic equilibrium and stability including energetic particles
  - Transport and turbulence
  - Disruption studies
  - CHI

- (There is also other ongoing research in the theory division that is relevant to NSTX-U.)

Research Areas

Transport and Confinement

- Micro-tearing turbulence in NSTX-U

  E. Startsev: GTS in core, S. Ethier

  W. Wang (with Y. Ren): Comparative studies of NSTX-U and DIII-D on effects of collisionality

  *C.-S. Chang/S. Ku: XGC in edge using full f

  Caveat: Key is successful implementation of electromagnetic effects, now in progress

- *GPI studies using DEGAS 2 (D. Stotler w/S. Zweben)

* Edge simulations will be part of the Boundary TSG

Next Steps

- Imperative that we have significant results to show for this partnership by the time of the next NSTX-U PAC meeting (low-hanging fruit) in Spring, 2014, and by the end of FY14
- Sharper definition of problems, solution strategies, and deliverables
- NSTX-U TSG leaders in Theory Department should call regular meetings of the TSGs (at least once a month, preferably once in two weeks) to discuss and monitor progress.

(slide from A. Bhattacharjee)