NSTX Team Meeting - Physics Analysis

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Transport-related Activities

- Predictive TRANSP work with GLF23 and Multi-mode models has started. Modifications to allow application of boundary condition at x< 1 is underway.

- Successful GYRO tutorial by Jeff Candy of GA was held two weeks ago, with 6 PPPLers in attendance. We hope to have access to the most up-to-date version of GYRO to aid in ongoing gyrokinetic analysis with GS2.

- W. Houlberg of ORNL is updating the neoclassical theory to include beam-thermal friction terms, which may provide a possible heat pinch source for explaining the relatively high ion temperatures. He will be defining the information he needs from TRANSP to complete this work.

Equilibrium Studies

- Luca Guazzoto from U. Rochester completed a two week visit to PPPL during which he implemented his equilibrium code FLOW. This code computes equilibria, including effects of rotation and pressure anisotropy. Code is currently being benchmarked and will be implemented in TRANSP over the next 3-6 months.

RF Modeling Updates

- TORIC: implementation of numerical equilibria in code instead of moments-style specification has been completed, but a few remaining performance and robustness issues need to be resolved so the code can be integrated into TRANSP.
- TRANSP+CURRAY package: “stand-alone” CURRAY which uses TRANSP input has been successfully debugged. Implementation in TRANSP is underway, including some required coding upgrades (naming conflicts, etc.)
- METS+HPRT: HPRT ray paths and TRANSP-generated hot ion distribution functions can now be utilized in METS, but a few remaining convergence issues need to be resolved.

RF Modelling updates……

- METS can now study HHFW propagation and absorption with anisotropic beams present in plasma. Parametric scans are underway to evaluate effects of beam anisotropy on absoprtion of HHFW's by fast ions.

- GENRAY / CQL3D:
  - HHFW: Benchmarking against HPRT, CUURAY and full wave codes underway; initial results encouraging
  - EBW: attractive current drive scenarios have been developed for plasmas with beta ~ 10-20%; work is underway to evaluate current drive possibilities in plasmas with beat ~ 40%.