

NSTX Team Meeting - Physics Analysis

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Transport Studies

- Gyrokinetic codes being used to determine nature of turbulent modes which contribute to transport in NSTX discharges with $T_i > T_e$ and in which the T_e profiles are resilient.
 - S. Kaye and J. Manickam held meeting with theorists and experimentalists to discuss whether micro-tearing modes, trapped electron tearing modes, or ETG modes play a significant role in these discharges
 - Initial simulations indicate that the symmetry of the mode eigenfunctions may be more consistent with micro-tearing modes than with trapped electron modes, but further studies are needed and have been planned.

HHFW Heating and CD Modeling

- Update on the integration of CURRAY into TRANSP:
 - CURRAY has been installed as a subroutine in TRANSP
 - Initial time-dependent tests of the model using a single ray yielded reasonable results for the plasma evolution
 - Time-dependent HHFW heating modeling will be available soon
 - HHFW CD profiles are available at specified time slices but are not yet coupled with the current diffusion module (further model development is required to enable this extension).

HHFW CD simulations for 5-year Plan

- In some parameter regimes in which $T_i > T_e$, some discrepancies in the power partitioning between ions and electrons predicted by HPRT and CURRAY have been found.
 - higher than anticipated ion damping can degrade the HHFW CD efficiency
 - discrepancies seem to be related to differences in formulation of local power absorption and kinetic flux terms in the overall energy balance equation; further studies are needed to determine the correct formulation in a ray tracing model.
 - comparisons with the all-orders, kinetic full wave code, AORSA , have been initiated to further study this issue.