NSTX

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T&T theory and computation brainstorming ideas

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T&T TSG
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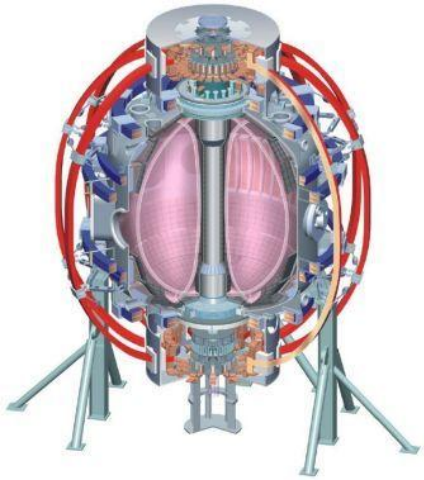

General ideas based on (i) development & validation of models and (ii) improving predictive transport capability

H-mode edge pedestal (how much overlap with Boundary TSG?)

- Empirical/semi-empirical scaling of pedestal height & width with "engineering" parameters (I_p, B_T, n_e, Z_{eff}) and/or theory parameters (ν_*, β, ρ_*)
- Development and (in)validation of pedestal height models with data (EPED1, any others)
- Non-linear simulations for pedestal turbulence (XGC, local gyrokinetic, any others)
- Predict microstability (KBM,…) thresholds in pedestal (linear gyrokinetics, any others)

H-mode core: fast particle driven transport (no overlap with WEP TSG?)

- Empirical/semi-empirical scaling of core T_e profile flattening with fast ion population, gradient, β_{fast}, etc…
- Simulations of fast particle driven instabilities and transport
- Development of reduced models (theory, semi-empirical, etc…) of χ_e(f.i.) for use in integrated simulations
- Same thing for V_φ, $j_{||}$ core profiles & χ_φ(f.i.), $D_{j||}$(f.i.) models

H-mode core: thermal driven transport

- Identify1D profile database for model validation tests, based on most relevant discharges for NSTX-U, CTF/FNSF/PP and beyond
- (In)validate TGLF (or develop other reduced models) with linear and nonlinear gyrokinetics for NSTX-relevant parameters
- Development of multi-scale & global non-linear simulations (limitation of cpu time?)
- Is it possible to included multi-scale & global effects in reduced models (usually local)?
- Reconcile anomalous electron + momentum transport with neoclassical ion transport