Summarized topics in MS

Category	Existing efforts	Associated physics issues
Improved equilibrium reconstruction including toroidal rotation, MSE, and SOL currents, and stability analysis	- EFITs including rotation - LRDFITs including rotation - (E,LRD)FITs + FLOW - (E,LRD)FITs + FLOW + M3D-C1	- Stability boundary with toroidal rotation? - Stability boundary including separatrix? - Can be routinely available between shots, with real time MSE, in NSTX-U?
Quasi-linear 3D equilibrium modeling including islands, neoclassical, and kinetic MHD effects	- IPEC with tensor pressures and islands + POCA + Inner-layer - FLOW, MARS-F, MARS-K - M3D-C1	- 3D equilibrium with opened islands? - 3D equilibrium with rotation? - 3D equilibrium with anisotropic pressures? - Self-consistent modeling for NTV in NSTX-U?
Quasi-linear stability modeling including neoclassical and kinetic MHD effects	- MISK with improved theory including anisotropic pressure - MARS-K, NOVA-K - M3D-C1	- RWM passive stability with 2nd NB in NSTX-U? - Effects of self-consistent eigenfunction? - Second RWM code with full kinetic treatment?
Non-linear (as well as linear) 3D modeling for time-evolving dynamics of islands, neoclassical, full kinetic MHD effects	- M3D-C1 with distribution function solver (Ramos theory or NTV theory) - XGC0	- Non-linear effects in 3D equilibrium and stability, including SW (q=1) and NTM? - Two fluid effects in 3D equilibrium and stability? - Full kinetic effects in 3D equilibrium and stability?
Disruption simulation, including MCI, gas penetration physics, and runaway electrons	- DEGAS2 for gas penetration - TSC for runaway electrons - M3D for disruption simulation - Use of 3D equilibrium sequence	- Gas penetration with atomic physics? - Runaway electrons in NSTX-U? - Coupling gas and plasma modeling? - Why does mode locking cause a disruption? - What is the origin of a density limit disruption?
Full 3D modeling of external structure for RWM dynamics	- Multi-mode VALEN3D - Plasma permeability with neoclassical and kinetic MHD effects - VALEN3D + Plasma permeability	- Full 3D current effects on RWM? - Effects of full 3D + kinetic plasma permeability on RMW stability and control? - RWM state space controller.