

Columbia U. Group 2011-12 Macro Stability TSG XPs

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NSTX Macroscopic Stability TSG Meeting

March 10th, 2011

PPPL

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 Colorado Sch Mines
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 Comp-X
 General Atomics
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 LLNL
 Lodestar
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 Nova Photonics
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 ASCR, Czech Rep
 U Quebec

V1.2

Columbia U. Group 2011-12 Macro-stability TSG XPs (Summary)

General Comments

- ❑ XPs address NSTX milestones and ITPA MHD joint experiments, MHD Working Groups
- ❑ XPs slated for 2011 could bridge into 2012, especially if not completed
- ❑ XPs slated for 2012 indicated as guidance, could run earlier if machine capabilities support them

Macro-stability TSG (2011)

- ❑ RWM stabilization dependence on energetic particle profile (Berkery) 1.0 days
- ❑ RWM stabilization/control, NTV V_ϕ alteration of higher A ST targets (Sabbagh) 1.5 days
- ❑ RWM state space active control physics (independent coil control)(Sabbagh) 1.0 days
- ❑ RWM state space active control at low plasma rotation (Y-S Park) 1.0 days
- ❑ NTV steady-state rotation at reduced torque (HHFW) – XP 1062 (Sabbagh) 0.5 days

Macro-stability TSG (2012)

- ❑ RWM control physics with partial control coil coverage (JT-60SA) (Y-S Park) 0.5 days
- ❑ RWM stabilization physics at reduced collisionality (Berkery) 1.0 days
- ❑ Neoclassical toroidal viscosity at reduced ν (independent coil control) (Sabbagh) 1.0 days

Columbia U. Group 2011-12 Macro-stability TSG XPs (Further detail)

Macro-stability TSG (2011)

- RWM stabilization dependence on energetic particle profile (Berkery) 1.0 days
 - Joint NSTX/DIII-D experiment, ITPA MDC-2
- RWM stabilization/control, NTV V_ϕ alteration of higher A ST targets (Sabbagh) 1.5 days
 - R(11-2), IR(12-1), MDC-2, MDC-17, WG7, PID control (examine snowflake configuration as well)
 - Use A scan at fixed κ (from SPG XP) to carefully examine NTV variation + gap scan for RWM
- RWM state space active control physics (independent coil control) (Sabbagh) 1.0 days
 - R(11-2), R(11-3), MDC-17, WG7, n = 1&2, vary gains/targets: (i) fiducial, (ii) low li, (iii) higher A, (iv) snowflake
- RWM state space active control at low plasma rotation (Y-S Park) 1.0 days
 - R(11-2), MDC-2, MDC-17, ITPA WG7
- NTV steady-state V_ϕ at reduced torque with HHFW – XP 1062 (Sabbagh) 0.5 days
 - IR(12-1), ITPA MDC-12, key data to complete XP1062

Macro-stability TSG (2012)

- RWM control physics with partial control coil coverage (JT-60SA) (Y-S Park) 1.0 days
 - MDC-2, MDC-17, WG7, mode non-rigidity, support for JT-60SA, connection to ITER
- RWM stabilization physics at reduced collisionality (Berkery) 1.0 days
 - R(12-3), ITPA MDC-2, test RWM stability theory for NSTX-U, ITER
- Neoclassical toroidal viscosity at reduced ν (independent coil control) (Sabbagh) 1.0 days
 - R(12-3), IR(12-1), ITPA MDC-12, test NTV theory for NSTX-U, ITER, other tokamaks
 - Include scans to investigate island-induced NTV (XP743 – approved, but never run)