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# MHD Experimental Task Group Pre-run Meeting

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MHD ETG 2003: First meeting – 12/19/2002

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# MHD ETG Meeting 12/19/02 - Agenda

- ❑ Run time guidance for CY03 MHD XPs
- ❑ Diagnostic status
- ❑ Review of XPs proposed at NSTX Forum
  - ❑ Check status of XP preparation
  - ❑ Review XP priority
  - ❑ New XP ideas?
- ❑ January and early February run: possible MHD XPs
- ❑ Scheduling of reviews for these XPs

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# Run Time Guidance for CY 2003

- ❑ Six experimental task groups
- ❑ 12 run weeks (60 days)
- ❑ MHD ET slated to have 7 run days out of 12 run weeks
  - ❑ RF and CHI to be given more time (8 days)
- ❑ The 7 run days does *not* include our contingency allotment
  - ❑ 10 total contingency run days for 6 Task Groups
- ❑ 8 “cross-cutting” run days – for XMPs – completely allocated

# Diagnostic Status for CY03 Run

- ❑ Most diagnostics ready for start of run (1<sup>st</sup> plasma)
- ❑ Diagnostic data available early in the run
  - ❑ Thomson scattering: 20 channel, 2 lasers after Rayleigh scat.
  - ❑ X-ray GEM detector: after 1<sup>st</sup> maintenance week
  - ❑ X-ray crystal spectrometer: after 1<sup>st</sup> maintenance week
  - ❑ X-ray transmission grating spectrometer: after 1<sup>st</sup> maint. week
- ❑ Diagnostic data not available until mid to late run
  - ❑ New CHERS (51 channel, 10 ms resolution) + edge CHERS
    - DAQ ready for first NBI plasma, calibrated data in April
  - ❑ Internal  $B_r$  and  $B_p$  RWM sensors
    - Mid-run availability (integrators needed)
- ❑ Diagnostics taking data, availability uncertain this run
  - ❑ MSE – first light on 4 channels March/April

# MHD XP Prioritization – NSTX Forum 9/13/2002

## ❑ MHD XP Presentations

- |  |                    |                                  |
|--|--------------------|----------------------------------|
| ❑ SOL Current during ELMS (Takahashi) –  | 0 days (piggyback) |                                  |
| ❑ Stability limits at increased elongation and reduced li (Menard)             |                    |                                  |
| • Plasma control capability might be an issue                                  |                    |                                  |
| • Useful to scan stability space; keep $q_{min} > 2$ at $B_t = 0.44T$          | (1-2 days)         |                                  |
| ❑ Resistive wall mode physics experiments (Sabbagh)                            |                    |                                  |
| • RWM stabilization physics at low A XP  | (1.5 days)         |                                  |
| • NSTX/DIII-D RWM similarity experiment XP                                     | (1.5 days)         |                                  |
| • RWM rotation damping physics XP (W. Zhu thesis work)                         | (1 days)           |                                  |
| ❑ Ohmic locked mode studies with short duration NBI (Menard)                   |                    |                                  |
| • Error field resonance / EFA near no-wall limit                               | (1 - 1.5 days)     |                                  |
| ❑ Beta limit dependence on triangularity (Gates)                               |                    |                                  |
| • Wants to complete database at $F_p \sim 2.4$                                 | (1 day)            |                                  |
| • How does $F_p$ vary with delta? Dave claims not.                             |                    |                                  |
| ❑ CAE (Fredrickson)  | (1 day)            |                                  |
| ❑ ELM physics in NSTX (Bush)   |                    |                                  |
| • ELM physics: identification (i.e n number, type, triggers, bootstrap)        | (1.5 days)         |                                  |
| • Overlap with T&T XP?   |                    |                                  |
| ❑ Chirping beam-ion driven instabilities (Heidbrink)                           |                    |                                  |
| • Dedicated run time expected to be needed                                     | (1 run day)        | <b>14 week</b> ↑                 |
| ❑ Fishbones, TAE(Fredrickson)  |                    |                                  |
| • High frequency ~ possibly 15 MHz modes (ICE, perhaps?)                       | (1 day)            | <b>(compress above run days)</b> |
| ❑ NTM (Fredrickson, Gates, M. Bell)  |                    |                                  |
| • NTM: high beta* $\tau$ shots could be good target plasmas                    | (1 day)            |                                  |
| ❑ Resistive wall mode physics experiments (Sabbagh)                            |                    |                                  |
| • (Resilience of low A plasmas to kink/ballooning modes XP: highly desire MSE) |                    |                                  |



# MHD XP Prioritization – MHD Mtg 12/19/2002

## ❑ MHD XP Presentations

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|--|--------------------|-------------------|
| ❑ SOL Current during ELMS (Takahashi) –  | 0 days (piggyback) |                   |
| ❑ Stability limits at increased elongation and reduced li (Menard)             |                    |                   |
| • Plasma control capability might be an issue                                  |                    |                   |
| • Useful to scan stability space; keep $q_{min} > 2$ at $B_t = 0.44T$          | (1-1.5 days)       |                   |
| ❑ Resistive wall mode physics experiments (Sabbagh)                            |                    |                   |
| • RWM stabilization physics at low A XP  | (1 days)           |                   |
| • NSTX/DIII-D RWM similarity experiment XP (? DIII-D commitment ?)             | (1 days)           |                   |
| • RWM rotation damping physics XP (W. Zhu thesis work)                         | (1 days)           |                   |
| ❑ Ohmic locked mode studies with short duration NBI (Menard)                   |                    |                   |
| • Error field resonance / EFA near no-wall limit                               | (1 days)           |                   |
| ❑ Beta limit dependence on triangularity (Gates)                               |                    |                   |
| • Wants to complete database at $F_p \sim 2.4$                                 | (1 day)            |                   |
| • How does $F_p$ vary with delta? Dave claims not.                             |                    |                   |
| ❑ CAE (Fredrickson)  | (1 day)            | <b>7.5 days</b> ↑ |
| -----  |                    |                   |
| ❑ ELM physics in NSTX (Bush)   |                    |                   |
| • ELM physics: identification (i.e n number, type, triggers, bootstrap)        | (1 days)           |                   |
| • Overlap with T&T XP?   |                    |                   |
| ❑ CAE / GAE – possible similarity XP with DIII-D (Heidbrink)                   |                    |                   |
| • Dedicated run time expected to be needed – must run AFTER DIII-D XP          | (1 day)            | <b>9.5 days</b> ↑ |
| -----  |                    |                   |
| ❑ Fishbones, TAE(Fredrickson)  |                    |                   |
| • High frequency ~ possibly 15 MHz modes (ICE, perhaps?)                       | (1 day)            |                   |
| ❑ NTM (Fredrickson, Gates, M. Bell)  |                    |                   |
| • NTM: high beta* $\tau$ shots could be good target plasmas                    | (1 day)            |                   |
| ❑ Resistive wall mode physics experiments (Sabbagh)                            |                    |                   |
| • (Resilience of low A plasmas to kink/ballooning modes XP: highly desire MSE) |                    |                   |



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# NSTX Jan-Feb 03 run – potential run days / XPs

## ❑ January

- ❑ Jan 13 week: HHFW and CHI

- ❑ Jan 20 week:

  - Jan 20 - 21: HHFW

  - Jan 22: OH run day, rtEFIT testing

  - Jan 23-24: initial NBI possible, rtEFIT testing

- ❑ Jan 27 week: NBI ops

## ❑ February

- ❑ Feb 3 week: maintenance

- ❑ Feb 10 week+: unscheduled

## ❑ Potential early MHD XPs:

- ❑ Ohmic locked modes; CAE; low delta double null

- ❑ Early XPs to be reviewed by group by Jan. 14th