ITPA: MHD Stability Topical Group

- Last meeting: UKAEA Culham, Oct. 6-9, 2009
  - With IEA workshop (W70) on Key ITER Disruption Issues
- Next meeting: NIFS, Toki, March 8-12, 2010 (proposed)
  - With US/Japan MHD workshop

http://itpa.ipp.mpg.de/

U.S. contacts: Ted Strait, Bob Granetz

Activities of MHD Stability Topical Group (2009-10)

- **Disruptions**
  - Electromagnetic forces and heat loads
    - Expand international database (MDC-15); validate models (DINA, TSC)
  - Runaway electron generation, confinement, and loss
    - Characterize seed mechanism, time scale, energy spectrum, … (MDC-16)
  - Disruption mitigation
    - Gas injection (MDC-1), pellets; validate models (NIMRAD, SOLPS)
  - Disruption avoidance
    - ECH, NBI torque, feedback stabilization, controlled shutdown (MDC-17)

Activities are aimed at model validation and resolution of key ITER issues.

Activities of MHD Stability Topical Group (2009-10)

- **Plasma stability control**
  - Vertical stability
    - Role of power supply noise, voltage and current limits, and disturbances in setting controllability limits (MDC-13)
  - NTM stabilization
    - Critical β (MDC-4); sawtooth seed control (MDC-5); ECCD stabilization (MDC-8); rotation effects (MDC-14)
  - RWM control
    - Resonant field amplification, stability thresholds (MDC-2); feedback control
  - Error field control
    - Non-resonant magnetic braking, validate NTV model (MDC-12)

Activities are aimed at model validation and resolution of key ITER issues.

New: Working groups for short-term ITER issues
Time scale = 6 ~ 12 months (for most topics)

WG-1: Waveforms of current in error field correction coils (A. Garofalo)
- For design of the power supplies and analysis of AC losses in external EFC coils.

WG-2: Guideline for optimization of distribution of ferritic inserts (M. Schaffer)
- Trade-off between minimization of TF ripple and low n error fields

WG-3: Power requirements for ECRH and ICRF control of sawteeth (I. Chapman)
- Assessment of power requirements for ECRH and ICRF control of sawteeth

WG-4: Diagnostic requirements for MHD stability control (TBD)
- Revise present diagnostic requirements for control of sawtooth, NTM, RWM, …

WG-5: Halo currents caused by disruptions (V. Riccardo)
- Improved halo current width model.
- Guidelines for $TPF \times I_h/I_{p0}$ and I_h/I_{p0} from new database activity.

WG-6: Sideways forces on vac. vessel and magnets caused by disruptions (T. Hender)
- Assess existing models to confirm the possible maximum sideways force.

If you are interested in contributing, please contact the working group leaders (shown here) or MHD group leaders (A. Sen, E. Strait, and Y. Gribov).