MDC-8 Current drive prevention/stabilization of NTMs

|  |  |  |  |
| --- | --- | --- | --- |
| **TG priority:** High | **Start date:** < 2008 | **Status:**  On-going | **Personnel exchange:**  Yes |
| **IO priority:** | **End date:**  N/A | **Motivation:** Stability of baseline scenario | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device /**  **Association** | **Contact**  **Person** | **2016 TG Request** | **Activity (from JEX/JA spreadsheet)** | | | | |
| **2012** | **2013** | **2014** | **2015** | **2016** |
| DIII-D | R. La Haye | Desirable | Considering | Committed | Considering | Considering |  |
| AUG | M. Reich E. Westerhof | Desirable | Committed | Committed | Committed | Committed |  |
| EAST | L. Q. Hu | Desirable | Committed |  |  |  |  |
| FTU | S. Nowak | Desirable | Committed | Committed | Committed |  |  |
| HL-2A | Y. Liu | Desirable |  |  | Analysis |  |  |
| JET | P. Buratti | Desirable | Not doing | Not doing | Not doing | Not doing |  |
| JT-60U/SA | A. Isayama | Desirable | Analysis | Analysis | Analysis | Analysis |  |
| KSTAR | M. Joung | Desirable |  | Considering | Considering | Considering |  |
| NSTX-U | S. Sabbagh | Desirable |  | Analysis |  |  |  |
| TCV | O. Sauter | Desirable | Committed | Committed | Analysis | Analysis |  |
| WEST | P. Maget | Desirable |  |  |  |  |  |

**This template is based on the 2014 report.**

**Purpose**

* Continue development of real-time control suitable for use on ITER
* Provide multi-machine data on power and other requirements for extrapolation to ITER with modeling

Comparison experiments are included:

* Pre-emptive current drive to prevent or mitigate 2/1 NTMs.
* Study influence of ECCD modulation, and ECCD width relative to NTM island width.

Overall the aim is to provide a range of data to benchmark the Rutherford equation for NTM evolution, allowing predictions for ITER ECCD requirements to be validated.

**Results for 2014**

**AUG, DIII-D**

– fully operational ECCD NTM stabilization systems implemented

**FTU**

– “minimal” real-time ECCD NTM stabilization experiments

– effect of central EC power on NTMs stabilization studied

**JET**

– ST control with HFS ICRH (for reducing NTM seeding)

**Plans for 2015**

* Possibly revisit and update below reference but for particularly deleterious m/n=2/1 mode rather than 3/2. This may include some new experiments as well as data-mining and be organized at next ITPA MHD mtg.
* R.J. La Haye, R. Prater, R.J. Buttery, N. Hayashi, A. Isayama,, M.E. Maraschek, L. Urso and H. Zohm, "Cross-machine benchmarking for ITER of neoclassical tearing mode stabilization by electron cyclotron current drive", Nuclear Fusion 46, 451 (2006).