Contribution ID: **203** Type: **Poster**

EX/P6-10: Physics and Technology in the Ion-cyclotron Range of Frequency on Tore Supra and TITAN Test Facility: Implication for ITER

Thursday, 11 October 2012 14:00 (4h 45m)

The ITER ion-cyclotron range of frequency (ICRF) heating system, required to couple 20MW of power to the plasmas in continuous wave (CW), have provide robust coupling for a variety of plasma scenarios with edge localized modes. To support the design of this system and to mitigate risks of operation in ITER, CEA has initiated some R&D programs accompanied by experiments together with modeling efforts. This paper reports recent results, including:
i. Test of a new Faraday screen (FS) concept electrically characterized by a slotted frame and cantilevered horizontal rods, on Tore Supra. RF sheath rectification is now better understood and included self-consistently in the ITER antenna physics design.
ii. First operation of CW test bed facility TITAN. This consists in qualifying the Tore Supra ICRH antenna in long duration operation of 1000s.
iii. R&D of high permittivity materials for the load test of the antenna under ITER plasma conditions.
In addition, results of the design of ITER ICRH scenarios using the full wave code EVE are reported, particularly the current drive efficiency calculation. In ITER, due to the simultaneous presence of multiple species there is no pure fast wave current drive configuration unlike present day experiments. Nevertheless, a current of ±200kA in DT, or, ±100kA in DT(3He) could be driven on axis with 10MW of power.

Country or International Organization of Primary Author

FRANCE

Primary author: Mr HOANG, Tuong (France)

Co-authors: Dr MESSIAEN, Andre (Association EURATOM-Belgian State); Mr ARGOUARCH, Arnaud (CEA - Institute for Magnetic Fusion Research); Dr KLEPPER, Christopher (Oak Ridge National Laboratory); Dr MILANESIO, Daniele (Department of Electronics, Politecnico di Torino); Mr ZARZOSO, David (CEA - Institute for Magnetic Fusion Research); Dr GUILHEM, Dominique (cea); Mr LOMBARD, Gilles (CEA - Institute for Magnetic Fusion Research); Dr BOTTOLLIER-CURTET, Herve (CEA - Institute for Magnetic Fusion Research); Dr GUNN, Jamie (CEA - Institute for Magnetic Fusion Research); Mr BERNARD, Jean-Michel (CEA - Institute for Magnetic Fusion Research); Mr JACQUOT, Jonathan (CEA - Institute for Magnetic Fusion Research); Dr COLAS, Laurent (CEA - Institute for Magnetic Fusion Research); Mr KUBIC, Martin (CEA - Institute for Magnetic Fusion Research); Dr FIRDAOUSS, Mehdi (CEA - Institute for Magnetic Fusion Research); Mr MEYER, Olivier (CEA - Institute for Magnetic Fusion Research); Mr MOLLARD, Patrick (CEA - Institute for Magnetic Fusion Research); Dr GOUARD, Philippe (CEA, DAM-DIF); Dr DUMORTIER, Pierre (Association EURATOM-Belgian State); Dr DUMONT, Remi (CEA - Institute for Magnetic Fusion Research); Dr CHAMPEAUX, Stephanie (CEA, DAM-DIF); Dr BRÉMOND, Sylvain (CEA - Institute for Magnetic Fusion Research); Dr LITAUDON, Xavier (CEA - Institute for Magnetic Fusion Research); Dr CORRE, Yann (CEA - Institute for Magnetic Fusion Research)

Presenter: Mr HOANG, Tuong (France)

Session Classification: Poster: P6

Track Classification: EXW - Magnetic Confinement Experiments: Wave–plasma interactions; current drive; heating; energetic particles