

§1. Activities on ITER/BA Collaboration

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Construction of ITER is in progress and the first building for assembling the superconducting poloidal field coils was completed in the ITER site. The ITER headquarters office building will be completed during the summer season in 2012. ITER organization and domestic agencies have signed 60 procurement arrangements, which amount to 71.5% of the total procurement value for the construction of ITER. The urgent issues are to decide to make the scenario of CS conductor and the cold test for TF coil. Another one is to make the scenario on W divertor installation. Broader Approach (BA) Activity is also in progress. High performance computer was installed in Rokkasho site and the computing speed of about 1 Peta flops was achieved. The official activities on computer simulation will be started from April in 2012. The Satellite Tokamak JT-60SA is in the manufacturing phase and will be in the assembly phase with the cryostat base delivery to Japan at the end of 2012. The joint work between EU and JA fusion communities completed the update of the JT-60SA Research Plan to Ver 3.9 in December 2011.

In this year, new collaboration activity on the development of fusion plasma diagnostics in ITER was started between JAEA and NIFS. The JAEA designated as the Japanese Domestic Agency for the ITER project is responsible for the procurement of several ITER plasma diagnostics. Plasma diagnostics in LHD have excellent performances and are highly evaluated in the world. It is very important to collaborate with JAEA members for developing and constructing the ITER diagnostics. After discussing about collaboration items, we decided to make collaboration for developing the microfission chamber to measure neutron flux, Thomson scattering system in edge plasma and divertor IR thermography.

We have a collaboration meeting to get information about ITER/BA activities in NIFS and to discuss the collaboration activities (participation in ITPA meetings and the ITER/BA related meetings), two times per year. The most important task in our group is to promote the participation in ITPA, in which the tokamak physics R&D activities are conducted for the ITER design/construction and for general tokamak research worldwide. The ITPA meetings are composed of seven groups (Transport and Confinement Physics; Energetic Particles; Edge Pedestal Physics; SOL and Divertor Physics; MHD Stability; Integrated Operation Scenarios; Diagnostics). The numbers of participants and presentations from NIFS in the 2011 fiscal year are summarized in Table 1. The total participants amount to 21 persons and there were as many as 21 presentations. The travel expenses for 11 participants in the ITPA meetings were supported with the budget for ITER/BA collaboration. At last, the main topics of our

presentations in the 2011 fiscal year are listed as following:

- ELM activities in LHD and comparison with tokamak
- Formation and termination of particle transport barrier in LHD
- Nonlinear evolution of AEs and GAM driven by energetic ions in LHD
- Benchmark results of the MEGA code on the n=6 TAE mode
- Melting of tungsten samples and metallic first wall in LHD
- Dust ejection experiment using sphere carbon dust with different diameters in LHD
- Results of MEGA code for the n=6 TAE benchmark
- Experimental study of error field mode in LHD
- Turbulence measurements and comparison with gyro kinetic simulation in LHD
- 3D MHD Equilibrium Analyses of ITER and DIII-D
- Recent results of high temperature mode, EC/ICRF heating and steady state operation in LHD
- Integrated transport code development and its application to LHD
- Summary of recent dust studies

Topical Group	Date (Place)	Participants (Presentations)
Transport and Confinement Physics	4-5 April (San Diego)	2 (2)
Energetic Particles	11-13 April (Frascati)	2 (3)
SOL and Divertor	16-19 May (Dipoli, Espoo)	2 (2)
Energetic Particles	12-13 Sep. (Austin)	1 (1)
MHD stability	4-7 Oct. (Padova)	1 (1)
Transport and Confinement Physics	5-7 Oct. (Cadache)	1 (1)
Edge Pedestal	5-7 Oct. (York)	1 (1)
Integrated Operation Scenarios	18-21 Oct. (Kyoto)	2 (2)
Cordinating Committee	12-14 Dec. (Cadache)	1 (0)
SOL and Divertor	16-19 Jan. (Juelich)	1 (1)
MHD stability	5-9 March (NIFS)	4 (4)
Energetic Particles	5-9 March (NIFS)	3 (3)
Total		21 (21)

Table 1. ITPA Meetings in 2011/2012.