

## §1. Activities on ITER/BA Collaboration

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Our activities on ITER/BA collaboration were regenerated as one of group activities in coordinating research projects, which were newly formed by reorganizing our institute. Our group consists of about 16 researchers including four managers indicated above and makes the ITER/BA collaboration meeting to discuss our activities and plans. The former ITER collaboration activities have been so far performed over 6 years from 2004 to 2009. The main tasks such as the contribution to the International Tokamak Physics Activity (ITPA) from helical community are taken over.

The ITER organization (IO) came into the phase of global procurement and manufacturing. Many contracts have been signed with industries in all ITER members to build elements of the machine or site installations. The project baseline on its schedule (the target date for First Plasma by the end of 2019 and DT operation with Deuterium and Tritium fuels in 2027) was approved in ITER council. Broader Approach (BA) Activity is composed of the complementary R&D projects to be conducted in parallel with ITER project for the construction of fusion DEMO reactor. The BA activities (IFERC, IFMIF/EVEDA and Satellite Tokamak JT-60SA) are in progress and various procurement agreements have been made. All the research buildings in Rokkasho site were completed in March 2010. High performance computer will be installed in near future.

The most important task in our group is to collaborate with ITPA, in which the tokamak physics R&D activities are conducted on an international level for many years resulting in achievement of a broad physics basis useful for all fusion programs, for the ITER design, 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). Now 13 persons from NIFS are listed as memberships of these topical groups. Each group meeting is planned to hold two times every year. We recognize the ITPA meetings as workshops on physics issues related to ITER and on comprehensive understanding of toroidal plasmas. Therefore, we are strongly promoting NIFS scientists' participation and presentation in the ITPA meetings. The numbers of participants and presentations from NIFS in the 2010 fiscal year are summarized in Tables 1. The total participants amount to 17 persons and there were as many as 13 presentations. The travel expenses for 12 participants in the ITPA meetings were supported with the budget for ITER/BA collaboration. Our contribution from helical community at Transport & Confinement and Pedestal &

Edge topical groups called ITPA members much attention to 3D effects in transport and confinement of toroidal plasmas. The new session on this issue was built up in Transport and Confinement Physics topical group.

We made an informal meeting on ITPA collaboration in December 2010 to exchange information about the topics in each ITPA group meeting and to advance the contribution from NIFS researchers. There were about 20 participants. Research activities and plans of each topical group were reported and we discussed the progress of our activities in the ITPA meetings. It is very important to participate in Joint Experiments with various types of confinement devices (tokamaks and stellarators etc.) and to join in code benchmark testing. It is better to make a meeting to present the results in our institute. The other important point is to participate in developing diagnostic systems for ITER.

For young scientists, we held a global meeting in February 2011 for understanding each other in various field of fusion science in cooperation with Fusion Energy Forum. This subject was of great importance in realizing a DEMO reactor. There were participants more than 40 persons including NIFS researchers.

Other ITER/BA collaboration activities include cooperation in the development of NBI ion sources and the control units of cryogenic system for ITER superconducting magnets. Design study to make a structure of ITER data processing system was another important collaboration task in our institute.

Topical Group	Date (Place)	Participants (Presentations)
Pedestal and Edge	21-23 April (Naka)	3 (1)
Energetic Particles	26-28 April (Garching)	1 (1)
Diagnostics	11-14 May (ORNL)	2 (3)
Transport and Confinement Physics	18-20 Oct. (Seoul)	3 (2)
Energetic Particles	18-20 Oct. (Seoul)	2 (2)
Pedestal and Edge	18-20 Oct. (Seoul)	1 (1)
SOL and Divertor	18-20 Oct. (Seoul)	1 (0)
Diagnostics	18-20 Oct. (Naka)	4 (3)
Total		17 (13)

Table 1. ITPA Meetings in 2010.