

### §3. Activities on ITER Collaboration

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The ITER Research Coordinating Group (Division of Academic Research Coordination, Coordination Research Center) promotes research activities coordinated with the ITER project, cooperating with the ITER Collaboration Committee, which consists of NIFS specialists in various physics and technology fields including visiting professors from JAEA.

The Division of Academic Research Coordination received the external peer review in this fiscal year [1]. Our activities in past three years were summarized and presented. For our activities, intensification of collaborations between universities, JAEA and NIFS was expected, consequently. We also presented out activities at the achievement debriefing session held by the Coordination Research Center.

The International Tokamak Physics Activity (ITPA) aims at cooperation in development of the physics basis for burning tokamak plasmas. The ITPA continues the tokamak physics R&D activities that have been conducted on an international level, and it has a close relationship to the ITER design. We recognize the ITPA meetings as a place where we contribute to ITER. We are promoting NIFS scientists' participation and presentation in the ITPA meetings on physics issues related to ITER and on comprehensive understanding of toroidal plasmas.

The ITPA meetings, which consist of seven groups, i.e. MHD, Disruption and Control; Confinement Database and Modeling; Transport Physics; Pedestal and Edge; SOL and Divertor; Steady State Operation; Diagnostics, are organized under the auspices of the ITPA Coordinating Committee. The numbers of participants and presentations from NIFS in the ITPA meetings held in the 2006 fiscal year are summarized in Table 1. The total participants amount to 17 and there were as many as 11 presentations. For example, the radial profile and the radial propagation of the geodesic acoustic modes (GAM) in CHS and JFT-2M were reported at the Transport Physics (TP) meeting held in Princeton. It was also discussed that the off-diagonal terms of momentum transport lead to spontaneous rotation in toroidal plasmas. In the TP meeting held in Chengdu, the characteristics of nonlocality in the electron heat transport in LHD was reported and compared with those in tokamak plasmas. The progress of the international collaborations on the confinement database of the helical plasmas was also reported. At the Pedestal and Edge meetings held at MIT and in Chengdu, the presentations on the internal diffusion barrier formation under the effective edge control by the Local Island Divertor drew much attention and contributed to the understanding of the toroidal plasmas. At the Diagnostics meeting held in Sendai, the investigation of the installation

of ITER lost alpha detector was presented. The recent progress in imaging bolometer R&D was also reported.

In the 2006 fiscal year, the activity on ITER collaboration was budgeted as same as the last fiscal year. The travel expenses for three participants in the ITPA meetings held at the domestic locations and six participants in the ITPA meetings held abroad were supported.

To build up a closer connection with the Japanese Domestic Agency (DA) is one of the most important tasks in our group. We held the periodical meeting with the domestic ITER team in 2006. We have been discussing the collaboration items; e.g. pellet injection system and superconducting magnets, mainly issues related to qualification of superconducting conductors. We are also closely connecting with the Fusion Energy Forum (former Fusion Forum), which is promoting the nuclear fusion research including the ITER project in Japan. For the coordination with the university researchers, we attended the coordinating meetings of Fusion Network including fusion engineering and plasma science.

Dr. R. Sakamoto (Research Operations Division, Department of LHD Project) attended the meeting for Pellet injection system on 9 March in 2007. ITER plans to adopt the same conceptual design as LHD and ToreSupra, i.e. pellet production by screw extruding method employing a small refrigerator and a pneumatic acceleration system. The pellet injection into burning plasma is completely new challenge; hence flexibility in the system is required to provide various experiments.

Topical Group	Date (Place)	Participants (Presentations)
Pedestal and Edge	10-12 Apr. (Boston)	1 (1)
Steady State Operation	10-13 Apr. (Naka)	1
Transport Physics	24-27 Apr. (Princeton)	2 (2)
Coordinating Committee	27-28 Jun. (Cadarache)	1
Diagnostics	4-8 Sep. (Sendai)	4 (4)
Transport Physics	23-26 Oct. (Chengdu)	3 (2)
Pedestal and Edge	23-25 Oct. (Chengdu)	2 (1)
Confinement Database and Modeling	23-26 Oct. (Chengdu)	1
MHD, Disruption and Control	23-25 Oct. (Chengdu)	1
SOL and Divertor	6-9 Nov. (Toronto)	1 (1)

Table 1. ITPA Meetings in 2006.

[1] Peer Review Report in FY 2006, NIFS Administrative Council External Peer Review Committee (2007).