

5. Japan-China Cooperation in Area of Magnetic Fusion Energy Research and Development and Related Fields

The collaboration between Japan and China has been started since 2008. The official title is “Cooperation in the Area of Magnetic Fusion Energy Research and Development and Related Fields”. The first Joint Working Group (JWG-1) for Implementation Arrangement between the MEXT of Japan and MOST of China was held at Chengdu in 2008. The 2nd Joint Working Group (JWG-2) was held at JAEA to discuss with the collaboration September in 2009. The several activities were introduced from bureaus and institutes during this meeting as follows:

- 1) Recent activities of MEXT, JAEA and NIFS from Japan
- 2) Recent activities of MOST, SWIP and ASIPP from China

The research activities achieved in the last year were reported:

- 1) Report of Joint Research Program from JA to CN
- 2) Report of Joint Research Program from CN to JA

The collaborations in this year were then presented, discussed and confirmed as follows:

- 1) Overall Status of Joint Research Program
- 2) Proposal of Joint Research Program from JA to CN
12 scientists (7 from NIFS) visiting SWIPP and ASIPP.
- 3) Proposal of Joint Research Program from CN to JA
22 scientists (9 to NIFS) visiting NIFS and JAEA.

Both sides recognized the participation of experiment and theory mainly through personnel exchanges, and the importance to develop the fusion technical cooperation, taking into account the avoidance of overlap of programs under bilateral S&T cooperation scheme, for example, ITER Agreement, Core University Program (CUP) and etc.

The JWG-2 agreed on the joint establishment of workshop or seminar under this arrangement. The JWG-2 agreed that the next meeting would be held in China. For the exact time and place of the meeting, it will be decided through consultation of two parties.

Brief reviews of collaboration results in each personal exchange are described as follows:

[Japan to China]

Yasuhiko Takeiri visited ASIPP (hosted by Zhimin LIU and Chundong HU) Jan. 18-24. He discussed the design and construction of the EAST-NBI system, which is projected to work in 2012. The planned EAST-NBI system consists of two tangential injectors with the deuterium injection energy of 50 – 80keV. For development of the injector, a neutral beam test stand is now under construction, and the assembly of a positive ion source has just started. The key issues for R&D of the ion source are discussed. The ion source test will be started in late 2010.

Hideya Nakanishi visited ASIPP (hosted by Bingia XIAO and Zhenshan JI) Feb. 7-13. Discussions about the advanced computing technologies for steady-state plasma experiments were made referring to the control and the data acquisition system for both LHD and EAST. R&D cooperation has been also agreed to substantiate the “Web portal” which should be friendly to the visitors and the remote collaborators.

Tokihiko Tokuzawa visited SWIP (hosted by

Xuantong DING) Jan.17~22. He presented recent progress of microwave reflectometer systems in LHD and had detailed discussions with the diagnostics and the control tools in HL-2A plasma. The density and its fluctuation profile measurements are essentially important, because the main purpose of the collaboration study is the particle confinement and transport physics. He also discussed about each plan of new diagnostic system, which is a Doppler reflectometer for the turbulent physics study.

Shuichi Yamada visited ASIPP (hosted by Yuntao SONG) and Huangshan (hosted by Yanfang BI) Oct.18-27. Yamada visited Prof. SONG in ASIPP to discuss the collaboration themes of SC related technologies and exchange persons of 2010FY. HTS Working Group Meeting for ITER was held in Huangshan, and the themes of update on the 10 kA prototype manufacturing status of preparations for the system test for the 68kA trial lead re-test and status of the fin-type HEX pressure drop test were discussed. These leads are for ITER, and are procured by China. Prof. BI and Prof. SONG are responsible persons for these HTS current-leads and Yamada is one of the reviewers of these items.

Noriyoshi Nakajima visited ASIPP (hosted by Deng ZHOU) and SWIP (hosted by Xuantong DING) from Jan.13-15, and SWIP from Jan.18-22, in order to investigate and discuss future collaborations on fusion theory and simulation. In both ASIPP and SWIP, two meetings and seminars (including presentations by young scientists) have been held, and it was concluded to hold WS or seminar as a first step through a tight information exchange with emphasis on the collaborations including young scientists.

Yukihiro Tomita visited ASIPP (hosted by Guangnan LUO) and SWIP (hosted by Longwen YAN)) Jan.12~23. At ASIPP the dynamics of dust particles and impurities was discussed in EAST tokamak and LHD plasma. The collaboration research on impurity transport during the GDC was started. At SWIP the dust dynamics in HL-2A plasma was discussed for the injection experiment of dust in this tokamak. The impurity transport near the first mirror was discussed. The Japanese side develops the plasma modeling and the impurity generation, and the Chinese side continues the experiments on impurity re-deposition on the inserted test plate.

[China to Japan]

In the fiscal year of 2009, two scientists of SWIP and six scientists of ASIPP visited NIFS. But Chinese fiscal year is different from Japanese one, so a few personal exchanges have not executed yet. Details are as follows:

- 1) Liu YI (SWIP, hosted by M.Isobe)
May 8~12, High energy particle measurement
- 2) Ping XU (ASIPP, hosted by H.Funaba)
Feb. 19~Mar.4. Impurity transport analysis
- 3) Bingia XIAO (ASIPP, hosted by H.Nakanishi)
Jan.18~24. Plasma control and data acquisition
- 4) Zhimin LIU (ASIPP, hosted by Y.Takeiri)
Mar.10~30. NBI design for EAST

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