5. Japan-Korea Fusion Collaboration Programs

NIFS and National Fusion Research Institute (NFRI) in Korea have been collaborated in several areas on fusion research. Its aim is principally to progress the KSTAR project which first plasma was scheduled in the summer of 2008. The human resource development programs for ITER project and future reactor design work are also important items of the international collaboration.

I. KSTAR Collaboration

This project consists of collaborations of diagnostic systems and plasma heating systems for KSTAR project which was successfully carried out in 2007.

1) Plasma Heating System

NIFS continued collaboration and experts exchange for joint development of ICRF long pulse technologies in areas such as transmitter, transmission components and instrumentation & control. Two Korean researchers joined LHD ICRF and ECH heating experiment. For the ICRF heating technology, various CW equipments were tested on both institutes. The ECH heating device on KSTAR was discussed to start KSTAR experiment smoothly. One Japanese NBI heating expert participated in the co-experiment at KAERI.

Workshop on Physics of Wave Heating and Current Drive was held in Korea. Technical and theoretical issues were discussed by participants in the following institutes; Kyoto University, Tsukuba University, NIFS and JAEA in Japan, and KAERI, NFRI, and POSTECH in Korea.

2) Diagnostic Systems

Eight Japanese researchers visited NFRI and discussed for the collaboration of diagnostics system, and agreed that collaboration activities in diagnostics area should be continued and enhanced.

2-1 Bolometer System

1) Resistive bolometer system (12 channels) was fabricated, assembled and leak tested in JA.
2) Preliminary design was made of KSTAR imaging bolometer in JA.
3) Phoenix IR camera was tested on LHD in NIFS and JT-60U in JAEA.
4) Prototype imaging bolometer for KSTAR was designed, installed and tested on JT-60U.

2-2 Edge Thomson Scattering System (Polychromators)

(1)One Japan(JA) expert visited Korea(KO), and discussed about interface between optical fibers and polychromators, optimum filter combinations.
(2)One JA expert gave a lecture about Thomson scattering diagnostics including hardware of LHD Thomson scattering system to graduate students in NFRI.

2-3 ECE System

(1)Heterodyne IF system using MIC technology has been developed in JA. Prototype of the 8 channel IF receiver and its test results were presented at the collaboration meeting on June 15 , 2007 at NFRI.
(2)KO has fabricated ECE collecting optics, and has equipped the circular smooth surface waveguide system.
(3)Both group discussed about the installation schedule of heterodyne radiometers for ECE as follows:

- Basic radiometer for 1st plasma (70-84GHz): by KO
- Baseline-I radiometer(86-110): by KO
- Baseline-II radiometer(110-162): by JA, 2008
- Baseline-III radiometer(164-196): by JA, 2009
- ECE radiometer system will be installed in the fiscal year of 2008.

II. Human Resource Development

1) Summary of personnel exchanges in FY2007.
The total number of people exchanged from Japan to Korea was 51 and that of from Korea to Japan was 19 respectively.
2) Workshops of various fields were held in each countries.
- WS on plasma heating and current drive system
- WS on wave heating and current drive physics
- WS on 5th IAEA steady state operation of magnetic confinement
- WS on blanket and tritium behavior
- WS on material technology for future reactor
- WS on blanket system using ceramic composite material

3) Dispatch
Researchers were dispatched for collaboration research works of following fields in each countries.

(Komori, A., Mutoh, T.)