§2. Communication between Fundamental Plasma Physics Groups at Kyushu University and NIFS Using SNET

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Fundamental plasma physics groups at Kyushu University and National Institute for Fusion Science (NIFS) are taking collaborative researches using linear devices called HYPER-I(NIFS) and HYPER-II(Kyushu Univ.).

HYPER-I device is capable of producing high density and high temperature plasmas using a high power microwave(2.45GHz, 80 kW), and a variety of experiments on fundamental plasma physics are ongoing with many researchers from domestic universities. The main objectives of HYPER-I experiments are (1)flow localization in an inhomogeneous magnetized plasma, (2)high temperature bubble formation in an ECR plasma, and (3)high resolution measurement of velocity distribution function using laser induced fluorescence (LIF) spectroscopy.

HYPER-II device at Kyushu University produces an ion-unmagnetized plasma to investigate the origin of plasma flow in an inhomogeneous magnetic field. The recent technologies developed in the modern optics are introduced to realize a high resolution measurement of velocity distribution function by using a tunable diode laser. In this device, a large volume ion-unmagnetized plasma has been produced, and the flow structure including flow reversal have been experimentally examined

The Kyushu University group is also undertaking the maintenance of HYPER-I device as the principal collaboration group. A smooth communication with the basic plasma physics group at NIFS is necessary to promote the collaboration. The activities using SNET are as follows.





(I) Remote participation to experiment

It is needed to build a real time communication for the remote experiment participation and machine maintenance. It is also needed to acquire the experimental data within the same day of experiment. The data acquisition using SNET greatly improve the collaboration activities. Remote experiment participation has been established in the large research project such as LHD project. A simple communication method for small project(HYPER-I project) at NIFS is useful for promoting collaborative researches in with the base of university laboratories.

(II) Smooth communication

It is beneficial for both the basic plasma physics groups to promote the collaborative research with HYYPER-I group at NIFS. SNET is used as the communication tool. Our laboratory (Kyushu University) is connected to NIFS by 1000BASE-T, and in the university campus, to Kyushu University LAN(1000BASE-T).

(III) Scientific literature search

There are many important literatures and journals in the NIFS library. Common demands for accessing these literatures and journals has been increasi8ng. By using SNET, we can access the literatures in NIFS library to view the contents and the important data, which greatly helps our collaborative research activities

By using SNET, we are possible to realize the remote experiment participation to HYPER-I system at the ECW experimental room in the R&D experimental building. Beside the communication to NIFS, SNET also provide a communication method in the laboratory, in which the office room is connected to the HYPER-II experimental room.

We are making a wide collaboration network in the basic plasma research centered at NIFS(HYPER-I device). SNET is an important tool to build up the efficient collaborations between university laboratories.

 S. Yoshimura, K. Terasaka, E. Tanaka, M. Aramaki, A. Okamoto, K. Nagaoka, and M.Y. Tanaka
 J. Plasma Physics, vol.81, 345810204(2015), doi:10.1017/S0022377814001147

2.S. Yoshimura, K. Terasaka, E. Tanaka, M. Aramaki, and M. Y. Tanaka Plasma Fusion Res. vol. 10, 028 (2015)

3. K. Terasaka
5th East-Asia School and Workshop on Laboratory, Space, Astrophysical Plasmas
(invited talk, POSTEC, Korea 2015)