

§3. SNET Communication between Fundamental Plasma Physics Group at Kyushu University and NIFS

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HYPER-I is a characteristic liner plasma production system using high power microwaves (2.45GHz, 80 kW), and a variety of experiments of fundamental plasma physics are ongoing with many collaborative researchers from domestic universities¹⁾⁻⁴⁾. Fundamental plasma physics group at Kyushu University consists of two researchers and 6 graduate students, and is the principal collaboration group with HYPER-I device, and is responsible for both the operation of device and the maintenance of system.

The main research objectives of HYPER-I experiment are (i) flow structure formation in inhomogeneous magnetic field, (ii) intermittent bubble formation in an ECR plasma, and (iii) high resolution flow velocity measurement with laser induced fluorescence(LIF) spectroscopy.

To examine the 2-dimensional flow structure in the plasma, the local probe data and the local LIF spectrum data are to be acquired, and the data volume exceeds a few GB for 1-day experiment. The machine time of the Kyushu University group exceeds 50 man-day/year, and therefore it is desirable to build a smooth communication system between NIFS and Kyushu University group to save researcher's traveling efforts.

The main purposes of SNET connection are

(I) Remote experiment participation

It is needed to build the remote experiment participation system, which makes us possible to acquire the experimental data from the laboratory at Kyushu University. Real time communications using SNET greatly improve the efficiency of collaborative activities. So far, remote experiment participation has been realized in the large research project such as LHD project. We have developed and extend remote experiment participation to small project (HYPER-I project).

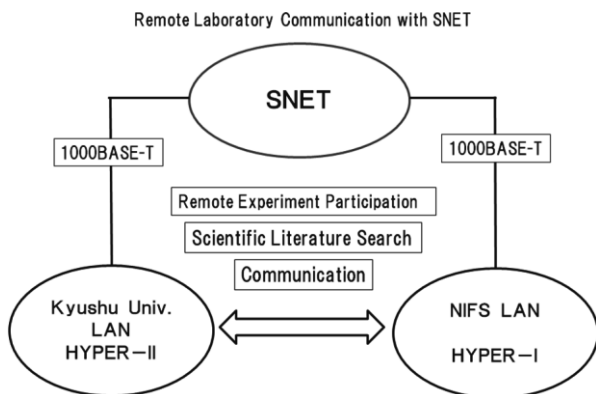


Fig.1 Diagram of SNET connection between Kyushu University and NIFS

(II) Smooth communication

It is beneficial for both groups to communicate at the remote experimental laboratories at Kyushu University and NIFS. Smooth communication between the laboratories increases the efficiency of daily collaborative activities. SNET is used for this purpose.

(III) Scientific literature search

There are many important literatures and journals in NIFS. Common demands for accessing these literatures have been increasing. By using SNET, we can freely access the literature in NIFS to view the contents.

Our laboratory (Kyushu University) was connected to NIFS in 2009 by using 1000BASE-T protocol (see Fig.1). Inside the university campus, Kyushu University LAN(1000BASE-T) is used.

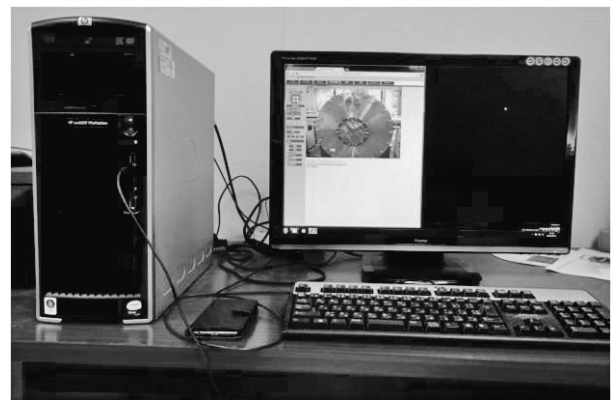


Fig.2. Workstation (Kyushu University) connected to NIFS by SNET .

Figure 2 shows a laboratory workstation (Kyushu University) connected to NIFS, and it is mainly used for remote experiment participation to HYPER-I experiment at the ECW experimental room in the R&D building. Beside the communication to NIFS, this system also provides a communication tool between the office room and the experimental room at Kyushu University, in which HYPER-II device is located.

We are constructing a wide collaboration system in basic plasma research with HYPER-I device. SNET is a key tool to realize smooth communications between different university groups.

1) Terasaka, K et. al.: Journal Plasma Physics (2014) DOI:10.1017/S0022377814000695

2) Terasaka, K. et. al.: Rev. Sci. Instrum. 85 (2014) DOI:10.1063/1.4901096

3) Yoshimura, S. et. al.: IEEE Trans. Plasma Sci.: (2014) 2554.

4) Yoshimura, S. et. al.: Journal Plasma Physics 8 (2015) , DOI:10.1017/S0022377814001147