## §2. Development of Remote Participation Environment with SNET on QUEST

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The QUEST is a spherical tokamak placed on the Advanced Fusion Research Center, Kyushu University. In this year, the diverter configuration was achieved with RF start-up, and the ohmic discharge over 100kA was also achieved. Hereafter, the QUEST project continues to focus on the establishment of the basis for the study of steady state operation, heat load control, particle control, and so on.

Since the QUEST is a major tokamak of All-Japan ST Research Program and Joint Usage, the QUEST project is carried out with the cooperation of many researchers of many facilities. In order to promote the QUEST project, it is important to construct the experimental environment which all researchers can easily participate in. For this, the things listed below are required.

- Collaborators of remote site can participate in experiment smoothly when they visit QUEST site.
- Researchers can participate in experiment even if they are on remote site.
- Any PC terminals can be used without any environmental setting.

Thus, the fundamental policy for this construction is that the researchers can participate in the QUEST experiment with just preparing WEB browser. The Web browser have been installed to the almost PC terminals, and can be used easily regardless of any remote sites. And, we can provide the uniformed and easy-to-operate user-interface to the researchers through WEB.

The QUEST Community Site (https://www. triam. kyushu-u.ac.jp/community/) provides the information such as the experiment plan, its schedule, and technical data of QUEST, and the researchers can communicate with each other by writing their information on this website. The researchers can browse the shot condition and its experiment operator's comment by the Experiment Log Site (http://www2.triam.kyushu-u.ac.jp/experimentalLog/), and the history of circuit connection between coils and its power supplies by the Coil Connection Log Site (http://www2.triam.kyushu-u.ac.jp/coilConfLog/). The QUEST Numerical Calculation Site (http://sim.triam.kyushu-u.ac.jp/simQUEST/) enables the researchers to calculate magnetic configuration, its equilibrium, and so on. Furthermore, the researcher who registers himself on a member of QUEST research team through the QUEST Community Site can browse various experimental data acquired by SNET based data acquisition system. This SNET-DAQ system transfers experimental data acquired on QUEST site via SINET which is a high-speed network connecting universities and research institutions each other, and stores data on high reliable NIFS data server. The researchers can browse these data via SINET without any delay.

The SNET-DAQ systems are installed at various locations on QUEST site (Fig. 1). For example, one system is installed at neighborhood of a plasma control workstation placed in the control room in order to acquire control signals and its response signals such as coil currents, plasma currents, and gas puff signals, and another system is installed at measurement station located in QUEST experimental hall in order to acquire magnetic signals. The advantage of the dispersed installations of the SNET-DAQ systems is that the each SNET-DAQ system can have the same reference potential to the each measuring instrument. Thus, the signal cables from the measuring instruments can be directly connected to the SNET-DAQ system without using the expensive broadband isolation amplifiers. Up till now the major signals derived from plasma discharge have been acquired by these SNET-DAQ systems and stored on the NIFS data server.

In the future, we want to expand these systems to other measuring instruments, and provide more sophisticated data to the collaborators by installing the way of the automatic simultaneous analysis of raw data and its storage.
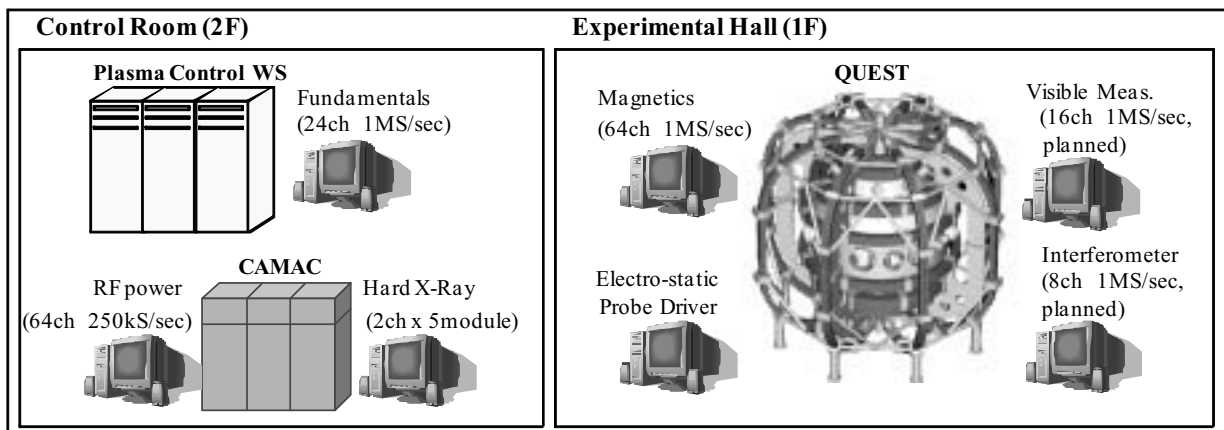


Fig. 1. Conceptual view of dispersed data acquisition: SNET-DAQ system is installed on neighborhood of each measuring instrument.