§43. World Wide Web and Java for Remote Monitoring of LHD Experiments

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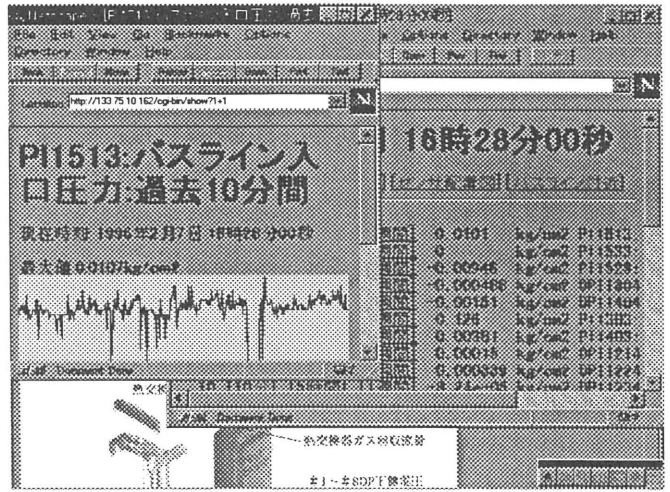Yamaguchi, S., Shoji, M.

We integrated World Wide Web (WWW) and Java interfaces into our UNIX-based data acquisition/analysis system.

WWW is a hypertext-based mode of communication widely used on the Internet. It was developed by Tim Berners-Lee of CERN as a means of scientific communication among remote researchers. Using WWW, experimental data can be sent as hypertexts with graphics.

The WWW framework was later extended by Netscape Communications Corporation to incorporate "server push," which enables real-time images to be sent successively without user intervention.

A more profound breakthrough is the Java programming language, developed by Sun Microsystems, Inc. A Java program (called an applet) can be sent, just like an image, from the WWW server to the client browser, and invoked within the browser. The browser can receive both real-time data and most recent version of monitoring software.

Figure 1 shows an IV-coil experiment being monitored with a popular WWW browser. The data was taken by our data acquisition system integrated with a WWW server, and sent to the network.

Fig. 2 shows contrived data, sent from a WWW server and displayed by a Java-based monitoring system invoked within the browser.

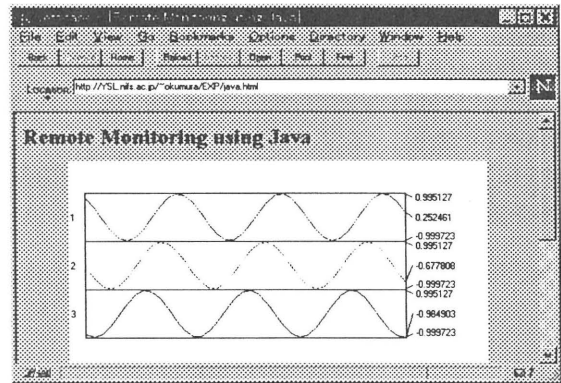We have also experimented on online shared notebook, and videoconferencing.

Fig. 1. A WWW interface to the IV-coil experiment.

Fig. 2. A Java interface to the IV-coil experiment.

References
1) Kariya, J. *et al. 53rd Meeting on Cryogenics and Superconductivity, Book of Abstracts* (1995), 127.
2) Okumura, H. *et al. 54th Meeting on Cryogenics and Superconductivity, Book of Abstracts* (1995), 122.
3) Kariya, J. *et al. ICEC16/ICMC, Abstract Booklet* (1996), 203.