Supporting activities for remote-participation of the LHD experiments

Remote participation support team (S. Ohdachi)

Goal of the support for the remote participation

- Many collaborator cannot directly visit NIFS from the COVID-19 symptoms. To activate the international/domestic collaboration, our group has been working to build the support framework for the collaborators. Our goals are,
- 1. Access to the information of the LHD experiments remotely.
 - 1. Video image of the front screen is shared by Zoom (9:00-21:00 Tue-Friday)
 - 2. Chat, oral discussion and file sharing are supported by Microsoft Teams. Theme Group.
- 2. Make the data handling easier.
 - 1. MyView2 is improved for sharing the plot template file. Plotting of the fundamental parameters becomes much easier. (Kobayashi-san, Emoto-san)
 - 2. Documents for the diagnostics are updated. (Mukai-san)
 - 3. Libraries / documents are updated and reorganized. Now, Python3 (Anaconda) is recommended environment since Enthought Canopy is no longer supported.
 - 4. Kaiseki web is re-built and all (or most) documents are written in English.
- 3. Lower the hurdle for the newcomer.
 - 1. Tutorial documents written in English is made.(Fujiwara-san, Takemura-san)

https://www-lhd.nifs.ac.jp/LHD/resouces.html

Concept of remote participation of LHD Experiments





Chat and oral discussion via Teams can be made, while Zoom connection is activated simultaneously



How to use LHD data –short introduction

- network (*.nifs.ac.jp, *.lhd.nifs.ac.jp) issues.
- Raw data and anaylized data

Network of NIFS for LHD experiments.



- There is firewall between the internet to NIFS lan.
- You can access limited web service, <u>www.lhd.nifs.ac.jp</u>, Zoom connection, Microsoft Teams connection.
- In order to access the experimental data of LHD, you need access the LHD lan using VPN connection.
- LHD data are organized as "Raw-data" and "Analyzed-data".

Data acquisition of the Large Helical Device

- Measured data are digitized by the distributed data acquisition system.
- Data are stored with an index of module name, channel number, and shot number.
- home> retrieve diagname (modulename) shotno subshotno chno. subshotno is defined for long-discharged
- Interface to C, PV-Wave and python exists. Windows, Mac and Linux (RedHat) are supported.



Fig. 5. Cross-sectional view of the LHD experimental building.

K. Kawahata el. al., Fus. Sci. Technology **58**(2010), 331

Analyzed Data(Kaiseki data)



- Analyzed data produce automatically after discharges.
- Analyzed text-based data format containing group of signals (e.g. wp, beta-dia, beta-vmec)
- Indexed by shot-no and data-name.
- Interface to PV-WAVE, python, ruby, matlab, fortran etc. are provided.



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Available data

- You can check the availability of the analyzed data using an application(GUIcleint) or isearch – s shotno on command prompt.
- Explanation of the diagnostics are located on https://wwwlhd.nifs.ac.jp/LHD/TechGuide_Diag .html.
- There are template for fundamental parameters, (neL, ip, wp, etc.) in MyView2 (data viewer) application.

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MyView2 (data viewer for LHD data)



 MyView2 and related softwares are updated to use Python 3 (Anaconda is recommended).

Lecture by Yoshinuma-san will be made.

Summary / Information

- Our team try to supply the three issues for supporting remote participation. Please give us comments for improving the supporting environments.
- PC server for Windows and Linux are also available for limited number of persons due to the limit of the performance of the server. Windows server will be improved. (See, kaiseki-dev.lhd.nifs.ac.jp)
- Seminar for the collaborator (to Japanese colleague, to EU colleague and to US Colleague) will be held on Oct 22nd, 2020 (Zoom: Meeting ID: 954 6658 4673 passcode: 277164)
 - 9:00-10:00 JST (US, Asia and Domestic collaborator)
 - 17:00-18:00 JST (EU, Asia and Domestic collaborator)
 - Ohdachi will give basic information.
 - Yoshinuma-san will give a lecture for MyView2.
- Dryrun for the experiments will be held on
 - Oct 16th 15:00-16:00 JST
 - Oct 23rd 9:30-10:30 JST

Thanks for the cooperation,

Emoto-san, Mukai-san, Kobayashi-san, Fujiwara-san (no photo), Takemura-san and Suzuki-san

