



Contribution ID: 63

Type: **Oral**

Oral_14.1 Introduction to LHD diagnostics

Thursday, 9 September 2021 09:45 (30 minutes)

The LHD is the world's largest (30 m ⁻³) helical plasma confinement device, with a major radius of 3.9m and an average small radius of 0.65m. In order to make the best use of the characteristics of the three-dimensional magnetic coordination, a number of diagnostics have been developed and applied. For profile measurements, electron temperature and density by Thomson scattering, electron density by FIR and CO₂ laser interferometer, ion temperature by CXS, rotational transform by MSE, impurity measurement by multi-channel spectrometer, etc. For turbulence physics research, PCI with spatial resolution using the pitch angle of the magnetic field, DBS with multi frequency channel, BS specialized for electron-scale measurement, and HIBP with potential and density information are utilized. Imaging measurements to promote intuitive understanding of complex plasma structure are also being developed, and IR bolometers, tangential SX cameras, BES, GPI, and ECEI are being applied. We are also trying to develop advanced measurements for the era of nuclear burning experiments, such as velocity and phase space measurements of high-energy particles using CTS, FIXS, CXS, etc. We have also developed and are using the LABCOM system, which is a sophisticated system for collecting data for each instrument and linking it with a data server, as well as the AutoANA system for automatic data analysis and MyView2, a dedicated viewer. These assets can be applied to other devices in the future, so please consider them.

This work was partially supported in part by KAKENHI (Nos. 19H01880 and 21H04973), by a budgetary Grant-in-Aid from the NIFS LHD project under the auspices of the NIFS Collaboration Research Program.

Primary author: TOKUZAWA, Tokihiko (National Institute for Fusion Science)

Presenter: TOKUZAWA, Tokihiko (National Institute for Fusion Science)