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4th LHD Workshop

The 4th Large Helical Device (LHD) workshop was held 18–19 March 2021 via Zoom. Usually, this workshop takes place at the National Institute of Fusion Science, and many colleagues discuss newly obtained results from the LHD experiment face-to-face. Unfortunately, due to the pandemic of COVID-19, the workshop was organized as a virtual workshop via the video conference system. Approximately 120 participants joined the workshop, including about 40 collaborators worldwide from Europe, the United States, China, and other Japanese labs. Many exciting results were presented and intensively discussed from the perspective of the next LHD campaign during the two days.

The first day featured mission-oriented topics for further extension of the operational space, including the simultaneous achievement of high ion and electron temperatures, the achievement of complete detachment, and core confinement improvement of long-pulse discharges as facilitated by electron cyclotron (ECH) and ion cyclotron (ICH) heating. Afterwards, energetic particle physics, advanced diagnostics, turbulent transport, and plasma-wall interaction issues were discussed. Especially in the evening, many German colleagues gave presentations, and so, we had essential discussions comparing LHD and Wendelstein 7-X (W7-X) results.

In the morning of the second day, we had discussions about topics on collaborations with US colleagues, emphasizing two newly installed resources: the IPD (Impurity Powder Dropper) and FIDA (Fast Ion D-Alpha spectroscopy) based on the negative ion source. In the IPD experiments, a clear change of turbulent transport during dropping of the impurity powder was observed. This result can lead to optimization of long-pulse discharges in stellarators. Also, the FIDA in LHD is the only such system in the world because LHD is the only device in which a negative ion source neutral beam injector can routinely inject into a high-performance plasma. Testing of the FIDA in JT-60SA, and eventually ITER, is also an important topic.

At the end of the workshop, the European colleagues reported the international collaboration supported by EUROfusion, and the future strategic planning of LHD collaboration with the world was discussed. Many essential comments and ideas were presented, and these will give a basis and perspective to the organization of the 23rd campaign.

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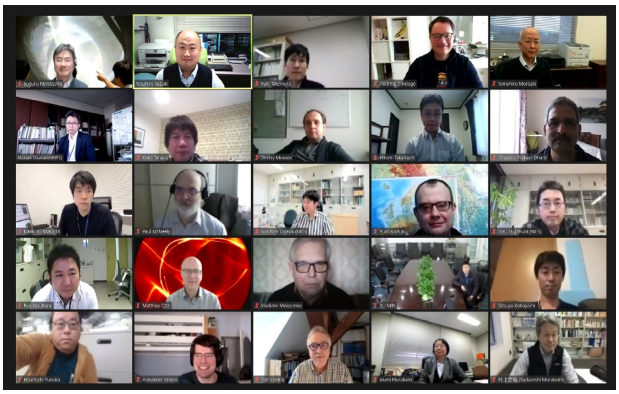

Fig. 1. Screenshot of participants on Zoom instead of the traditional "group photo."

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The 4th LHD workshop was held 18–19 March 2021 to discuss new results obtained during the 22nd campaign of LHD and future strategic planning. 1