

# IFERC Newsletter

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REC

## REC demonstration with WEST

A remote experiment with WEST tokamak was demonstrated in the ITER Remote Experimentation Center (REC) of Rokkasho for the first time on November 28th 2018. The REC room had been completed in 2017 as a mimic control room for a remote site, including a broadband network, a large video wall, IT equipment and the necessary equipment for remote participation. By using the REC room and the software prepared for the remote participant, a demonstration was organized in order to verify the full function of remote experiment required in future experiments, such as in ITER.

WEST, the Tungsten (W) Environment in Steady-State Tokamak, is located just a few hundred metres from the ITER site at the French Institute for Magnetic Fusion Research (IRFM). It is suitable to test the participation in remote experiments from a facility very far away, as the distance between REC and WEST, like ITER, is about 10000km. The demonstration was carried out as part of a planned experiment in WEST's 2018 campaign. It consisted in exposing tungsten components to strong heat fluxes from the plasma.

The demonstration started by the pulse preparation in REC, where the remote session leader edited pulses remotely accessing the pulse editor, Xedit, on the Altair

server prepared for the remote participants in WEST. The shot schedule was edited smoothly and the sequence of plasma discharge started after the validation and approval by the authorized operator in WEST.

The large video wall in the REC room, displayed the real time countdown of the plasma discharge, a video of plasma generated in WEST tokamak, the live data of the time trace of the main parameters of the plasma, such as the current and the plasma density, in addition to the view of the video conference system, as shown in the figure. The live data were very effective for understanding the state of the discharge and the total experiment.

After the shot, detailed data, such as 2D plasma equilibrium, the heat load on the divertor plate, etc., were viewed by remote access to the software of the data analyses on Altair server in WEST side. The useful data were viewed and analyzed in REC, though the latency of the visualization depends on the amount of data. The fast data transfer from on-site to remote-site will be effective for far remote sites.

The demonstration was finished successfully and it became a big step in the realization of the remote experiment in the future tokamak facility, such as ITER.



Large video wall in the REC room showing the video conference and countdown (left), the live data of the main plasma parameter (center), the video of the plasma (right), and so on.