

# (TG1) Multi-ion group report



Oct. 14, 2022 (M. Kobayashi)

Date: Oct. 13, 2022

Time: 9:34 -10:53, 15:35 – 18:45

Shot#: 180308 – 180333, 180406 - 180466 (87 shots)

Prior wall conditioning: No

Divertor pump: On

Gas puff: H<sub>2</sub> IPD: No

LID: Off

NBI#(1, 2, 3, 4, 5)=gas(H, H, -, H, H)=P(3.7, 3.4, 2.1, 3.5, 3.6) MW

ECH(77GHz)=ant(5.5-U, 2-OUR)=P(333, 365)kW

ECH(154GHz)=ant(2-OLL, 2-OUL, 2O-LR)=P(398, 364, 343) kW

ECH(116GHz)=ant(2O-LR)=P(-)kW

ECH(56GHz)=ant(1.5-U)=P(288)kW

ICH(3.5U, 3.5L, 4.5U, 4.5L) = P(0.28, 0.33, 0.13, 0.15) MW

Neutron yield integrated over the experiment =  $1.08 \times 10^{13}$

## Topics

1. Research of ICRF antenna property by the power modulation in LHD (D. Du, K. Saito et al.)
2. Experimental tests of lithium powder injection for plasma modification in stellarator geometries (R. Lunsford)

# Research of ICRF antenna property by the power modulation in LHD

● Shot No:180308-180333, 180406-180429

D. Du, K. Saito, J. Kwak, T. Seki, H. Kasahara, R. Seki

● Experiment conditions:

( $R_{ax}$ ,  $B_t$ ,  $\gamma$ ,  $B_q$ , Polarity)=(3.6m, 1T and 2.75T, 1.2538, 100%, CW), Working gas:  $H_2$ ,  $n_e=0\sim5 \times 10^{19} m^{-3}$ ,

Heating system:ICRF(3.5U, 3.5L, 4.5U, 4.5L), ECH (0.3s for start-up), NBI(#1, #2)

#180312( $B_t=1T$ ,  $n_e=5 \times 10^{19} m^{-3}$ , CW, red color)

#180297( $B_t=1T$ ,  $n_e=5 \times 10^{19} m^{-3}$ , CCW, blue color)

● Experiment purpose:

1) Comparing the S matrix of U and L antennas (ICRF antenna property

with COMSOL simulation

2) Designing load resilient system for generalized conjugate-T by

S matrix

we measure the S matrix with real plasma.

● Experiment results:

On Oct. 12, we measured the S matrix with the polarity of CCW .

When other conditions are the same, the S matrix has a different

magnitude and phase with the magnetic field changing from CCW

to CW. Detailed analysis will be done in the future.

