

(TG1) Multi-ion Plasma group report



Dec. 8, 2022 (H. Kasahara)

Date: Dec. 7, 2022, Time: 13:35~15:55

Shot# 185318~185361, Neutron counts = 1.8×10^{13}

Prior wall conditioning: GD-H2, Div cryo: ON, Gas puff: H₂, Ar, IPD: B, C, Li, BN

NBI(1, 2, 3, 4, 5) = gas(H, H, H, H, H) = P(3.32, 4.19, 4.23, 5.10, 5.13) MW

ECH(56GHz, 15U) = P(-) MW

ECH(77GHz, 55Uo, 2Our) = P(0.70, -) MW

EH(154GHz, 2Oll, 2Oul, 2Olr) = P(0.72, 0.80, 0.99) MW

ICH(38.47MHz, 3.5U, 3.5L, 4.5U, 4.5L) = P(-, -, -, -) MW

Topic

1. The evaluation of the toroidal uniformity of the boron deposition on the divertor plates for the real-time boronization using the impurity powder dropper (M. Shoji)

The evaluation of the toroidal uniformity of the boron deposition on the divertor plates for the real-time boronization using the impurity powder dropper (M. Shoji)

● Shot No: #185318~#185360 (7th Dec. 2022)

● Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.60 \text{ m}, \text{CW}, 2.750 \text{ T}, 1.2538, 100.0 \%)$, Fueling Gas: Hydrogen, IPD: B($d=150 \mu\text{m}$), C($d=120 \mu\text{m}$), NBI: #1, #2, #3, #4, #5, $n_{e, \text{bar}} = 1 \sim 6E+19 \text{ m}^{-3}$

● Background and motivation:

- ERO2.0 simulation code predicts the toroidally localized distribution of boron deposition using the IPD for high plasma densities.
- For validating the simulation, the boron deposition density on carbon sample target plates installed at two toroidal positions (4.5-L and 10.5-L) will be investigated using the two manipulators.

● Preliminary results:

- Bright light at the carbon sample targets was observed with visible CCD cameras (10.5-U) during the plasma discharges.
- The distribution of the emission of dropped boron powders clearly changed with the plasma density.
- The 3-d trajectories of boron powders were observed with the stereoscopic fast-framing camera (2.5-U).

Image from 2.5-U

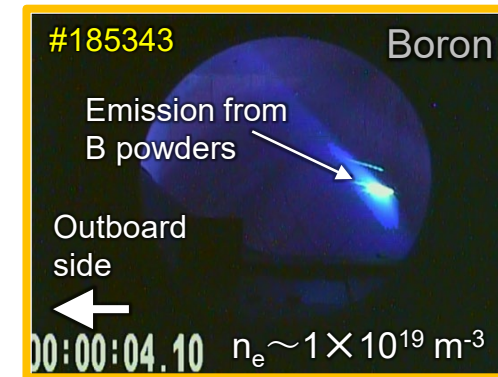


Image from 10.5-U

