

# (MAP) Session Report



Date: Mar. 19, 2024

Time: 14:39 – 16:42

Shot#: 187739 – 187774 (36 shots)

Prior wall conditioning: None

Divertor pump: On

Gas puff: H<sub>2</sub>

Pellet: None

Mar. 20, 2024 (C. Suzuki)

NBI#(1, 2, 3, 4, 5) = gas(H, H, H, H, H)=P(3.2, 3.4, 3.8, 3.3, 4.8) MW

ECH(77GHz) = ant(1.5-Uo, 5.5-U, 2-OUR)=P(-, 0.70, 0.50) MW

ECH(154GHz) = ant(2-OLL, 2-OUL, 2-OLR)=P(0.39, 0.45, -) MW

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

## Topics

1. Investigation of the impurity shielding performance of the LHD peripheral plasma using the IPD (M. Shoji)

# Investigation of the impurity shielding performance of the LHD peripheral plasma using the Impurity Powder Dropper (IPD)

(M. Shoji)

## Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.60 \text{ m}, \text{CW}, 2.75 \text{ T}, 1.2538, 100\%)$ , Shots: #187739 - #187753  
 $= (3.75 \text{ m}, \text{CW}, 2.64 \text{ T}, 1.2538, 100\%)$ , Shots: #187754 - #187774

ECH: only for start-up, NBI: BL1+BL2+BL3+BL4+BL5, IPD: Li, Si, B

## Objective:

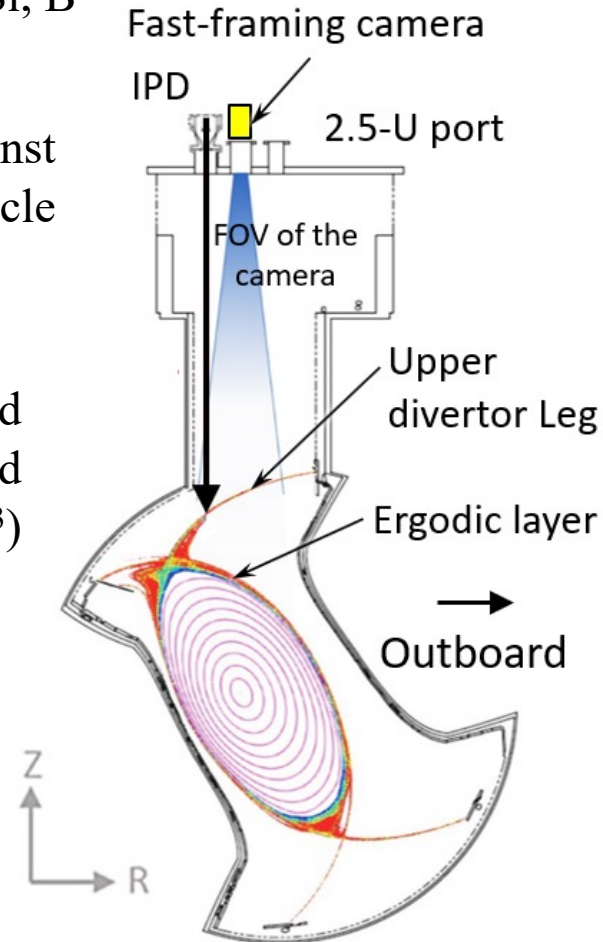
The shielding performance of the LHD peripheral plasma against impurity dust particles was investigated by measuring the dust particle trajectories and the ablation positions using a fast-framing camera.

## Experiment:

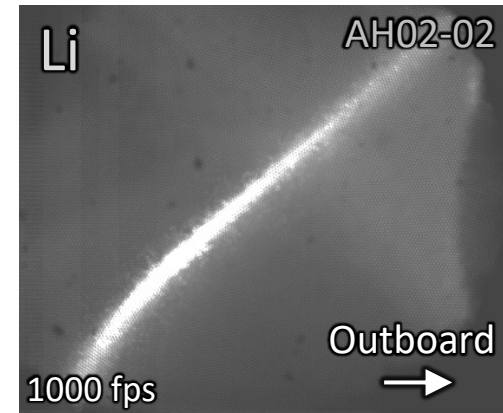
The ablation positions of impurity dust particles (Li, Si, B) dropped from the IPD were observed with the fast-framing camera (installed next to the IPD) in high-plasma density discharges ( $\bar{n}_e \sim 5 \times 10^{19} \text{ m}^{-3}$ ) for two different magnetic configurations ( $R_{ax} = 3.60 \text{ m}$  and  $3.75 \text{ m}$ ).

## Results:

The ablation position of Li dust particles ( $d = 500 \text{ nm}$ ) for  $R_{ax} = 3.60 \text{ m}$  moved to the outboard side. It can be explained by the deflection of the trajectory of the dropped dust particle by the effect of the plasma flow in the upper divertor leg which is higher for  $R_{ax} = 3.60 \text{ m}$  than for  $R_{ax} = 3.75 \text{ m}$ .



#187753  $R_{ax} = 3.60 \text{ m}$



#187765  $R_{ax} = 3.75 \text{ m}$

