

(SG3, IA) Session Report

April 10, 2024 (T. Kawate)

Date: April 9, 2024

Time: 14:30 – 16:45

Shot#: 189189 – 189231 (43 shots)

Prior wall conditioning: He

Divertor pump: On

Gas puff: H₂, He, Ar, CH₄

Pellet: no

NBI#(1, 2, 3, 4, 5) = gas(H, H, H, H, H)=P(4.4,4.0,4.2,3.6,5.0) MW

ECH(77GHz) = ant(1.5-Uo, 5.5-U, 2-OUR)=P(-,0.70,0.38) MW

ECH(154GHz) = ant(2-OLL, 2-OUL, 2-OLR)=P(0.71, 0.81, 0.98) MW

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

Topics

1. Transport study in ECRH superposed ion ITB plasma (S. Sumida, M. Osakabe)

LHD experiment summary on 9 April 2024

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Experimental conditions:

(R_{ax} , Polarity, B_t , γ , B_q) = (3.60 m, CW, 2.75 T, 1.2538, 100.0%)

Purpose:

To construct database of high-energy NB shine-through at various n_e , T_e , impurity ion density and N-NB combinations to investigate influences of multistep ionization and fast ion ionization.

Result:

- The shine-through rate is successfully measured under almost stationary n_e condition at
 - ✓ $\bar{n}_e = 0.4 \sim 3 \times 10^{19} \text{m}^{-3}$
 - ✓ $T_{e0} = 2 \sim 12 \text{keV}$
 - ✓ two N-NB combination patterns (NB#1 and NB#1)
 - ✓ H, CH₄ and H-He plasma=> Database constructed
- Impurity ion (C & He) densities are measured with CXS.
- The database will be analyzed with HFREYA and GNET codes.

Example of CH₄ discharge

