## (TG2) Turbulence Topical Group Report



Date: Oct. 20, 2022 Time: 9:45 - 14:03 Shot#: 180948 – 181031 (83 shots) Prior wall conditioning: None Divertor pump: ON Gas puff: H2 , Pellet: None NBI#(1, 2, 3, 4, 5)=gas(H, H, H, H, H)=P(2.2, 1.9, 1.9, - , 3.4 )MW ECH(77GHz)=ant(5.5-Uout (or 1.5U), 2-OUR)=P(703, 792)kW ECH(154GHz)=ant(2-OLL, 2-OUL , 2-OLR)=P(723, 799, 825)kW ECH(56GHz)=ant(1.5U)=P( - )kW ICH(3.5U, 3.5L, 4.5U, 4.5L)=P( -, -, -, - )MW Neutron yield integrated over the experiment = 6.8 x10<sup>12</sup>

Remarks

NBI#1-B has not been enable. Some diagnostics' shutters were closed in the beginning of the day.

Topics

1. Potential and density fluctuation measurement in e-ITB to study isotope effect (A.Shimizu / M. Nishiura)

Oct. 21, 2022 (T. Tokuzawa)

# Potential and density fluctuation measurement in e-ITB to study isotope effect M. Nishiura, A. Shimizu, Oct. 20 2022



#### **Experimental Condition**

- #180946 # 181008 (Rax=3.75m, Bt=1.375T, gamma=1.254, Bq=100%)
- #181009 # 181031 (Rax=3.6m, Bt=1.375T, gamma=1.254, Bq=100%)

#### Background and objective

- HIBP measures a plasma potential with e-ITB to study isotope effect. The threshold power to form the e-ITB for D is lower than that for H[T. Kobayashi Sci. Rep. 2022]. We considered that the higher ECH power would keep the difference. However, the isotope effect for e-ITB and potential has no clear difference in the P<sub>ECH</sub>/n<sub>e</sub> of 2.5.
- Therefore, we examined the P<sub>ECH</sub>/n<sub>e</sub> of 1, 1.4, 2.1 and 3 to clear the minimum power to form the e-ITB for H.

#### **Results**

The electric potential profiles at r/a=0-0.8 were obtained to estimate Er.



### Temperature profile during ECH modulation

#### <u>Results</u>

- We found the threshold power of e-ITB at low Bt=1.375T.
- D experiments at the same input power would give the isotope effect.
- We can discuss the dependence of e-ITB formation on Bt.





•  $P_{ECH}/n_e$  of 1.4(0.7kW/0.5m<sup>-3</sup>) Small increase in Te appeared at ECH-ON gives a low  $\delta \nabla T_e$ 



•  $P_{ECH}/n_e$  of 3(1.5kW/0.5m<sup>-3</sup>) Large increase in Te appeared at ECH-ON gives a high  $\delta \nabla T_e$ 

#### **Results**

- Potential change during ECH modulation was measured.
- Amplitude of potential change depends on ECH modulation power.
- These reference data will be compared with D discharge.

