

# (SG2, TC) Session Report

April 26, 2024 (M.Yoshinuma)

**Date:** April 25, 2024

**Time:** 10:35 – 14:15

**Shot#:** 190243 – 190309 (67 shots)

**Prior wall conditioning:** No

**Divertor pump:** On

**Gas puff:** H<sub>2</sub>, Ar

**Pellet:** No

**NBI#(1, 2, 3, 4, 5) = gas(H, H, H, H, H)=P(4.2, 4.3, 4.4, 3.8, 4.1) MW**

**ECH(77GHz) = ant(1.5-Uo, 5.5-U, 2-OUR)=P(0.698, 0.38, 0.705) MW**

**ECH(154GHz) = ant(2-OLL, 2-OUL, 2-OLR)=P(0.889, 0.982, -) MW**

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

## Topics

1. Investigation of electron-scale turbulence and its influence to transport( T. Nasu)
2. Verification of the effect of magnetic field geometry on zonal flow in 3D confined configuration (S. Satake)

# Investigation of electron-scale turbulence and its influence to transport

Shot#: 190243 - 190287

**Proponent:** Tatsuhiro Nasu, Tokihiko Tokuzawa, Motoki Nakata

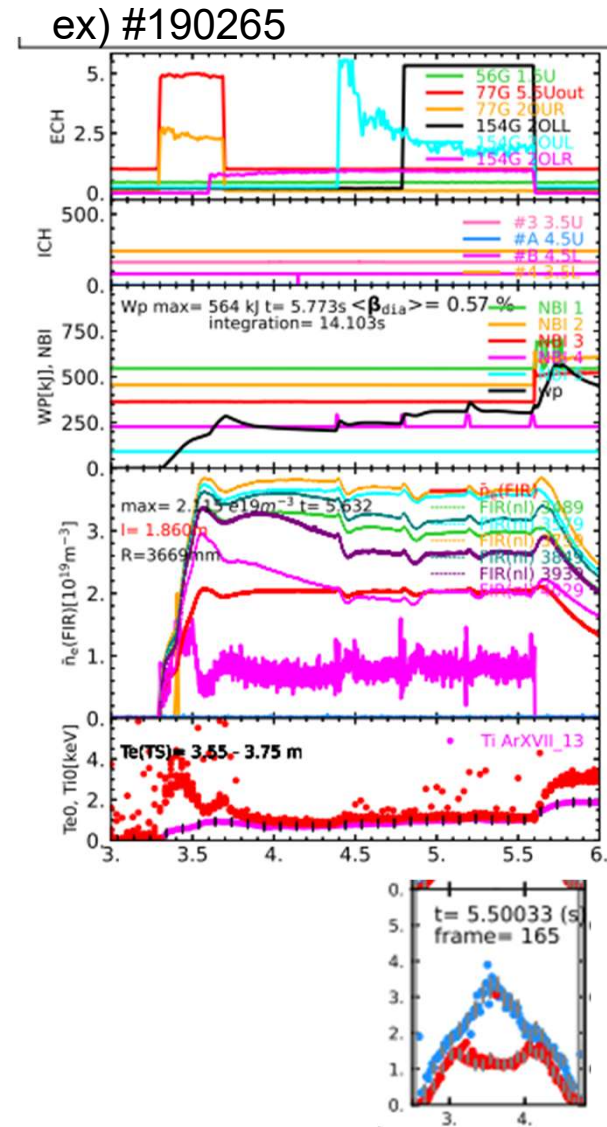
**Background:** We have investigated electron-scale turbulence characteristics because its influence to transport is not ignorable in high  $T_e$  plasma. Especially, we observed their intensity dependence on  $R_{ax}/L_{Te}$  in D plasma with constant  $T_e/T_i$  in 24<sup>th</sup> LHD experimental campaign. To investigate the difference in the characteristics by isotope effect, we tried to observe intensity dependence on  $R_{ax}/L_{Te}$  in H plasma.

## Experimental conditions:

- $(R_{ax}, B_t, \text{polarity}, \text{gamma}, B_q) = (3.6, 2.75, \text{CW}, 1.2538, 100)$ , gas: H

## Results:

- On-/off-axis ECHs were used to control  $T_e$  profile with control of power and deposition location.
- We could attain hollow  $T_e$  profiles.
- More detailed analysis of the relationship between turbulence and transport will be available in the near future.



# 2024/4/25 “Verification of the effect of magnetic field geometry on zonal flow in 3D confined configuration”

S. Satake (NIFS)

## Objective of the experiment

Investigate the relationship between the geodesic curvature of the magnetic field and the suppression of turbulent by zonal flow

## Operation

- Plasma :  $R_{ax}=3.70$ ,  $B_{ax}=2.676$ ,  $\gamma = 1.2538$ ,  $B_q=100\%$ , CW
- Diagnostics : HIBP (core-Er), CXRS(edge-Er), PCI, BS, DBS(ion&electron-scale fluctuation)
- ECH and NBI power changed gradually during a shot
- Density scan by gas puff. ( $n_e \sim 0.8, 1.2, 1.6, 2.0e19$ )
- Te was very high ( $\sim 6\text{keV}$ ) in the ECH-only phase and then stepped down as tangential NBI was added.
- Ti was 2~2.5keV during ECH was on. At  $t > 5.0$  when ECH turned off, both Te and Ti dropped suddenly.
- Saw-tooth like behavior was observed in Te prof. when strong heating was applied.
- Positive-Er @  $r > 0.5a$ . Probably electron-root.
- As density increased by gas puff, Te and Ti dropped ( $Te \sim 3\text{keV}$ ,  $Ti \sim 1\text{keV}$ ) and Te perturbation was not observed.
- HIBP and fluctuation measurements will be checked to see the change in the Er and turbulent.
- Different configurations (Bq scan) will be done in next year.

