

# Daily Report for 2025-10-01

R. Seki

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**Date:** October 1, 2025

**Time:** 10:00 – 17:15

**Shot:** 193999 – 194127 (129 shots)

**Prior wall conditioning:** No

**Divertor pump:** On

**Gas puff:** H, Ar

**Pellet:** H pellet

**NBI:** #1, #2, #3, #4, #5

**ECH:** 2-OUR (77GHz), 5.5-UO (77GHz), 2-OUL (154GHz), 2-OLL(154GHz)

**ICH:** 4.5 U, L (Commissioning)

## Topics

1. Density modulation experiments for the gyro-kinetic validation. (K. Tanaka)
2. Investigation of high-k turbulence dependence on collision frequency (T. Nasu)
3. Measurement of Plasma Dynamics during Core Density Collapse (CDC) in LHD (D. D. Hartog, N. Kenmochi)

# Density modulation experiments for the gyro-kinetic validation

K.Tanaka, H. Okuwada (Kyushu Univ.)

## Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.55 \text{ m, CCW, 2.78 T, 1.2538, 100.0\%)$

#193999- #194016

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.6 \text{ m, CCW, 2.75 T, 1.2538, 100.0\%)$

#194017 - #194035

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.75 \text{ m, CCW, 2.64 T, 1.2538, 100.0\%)$

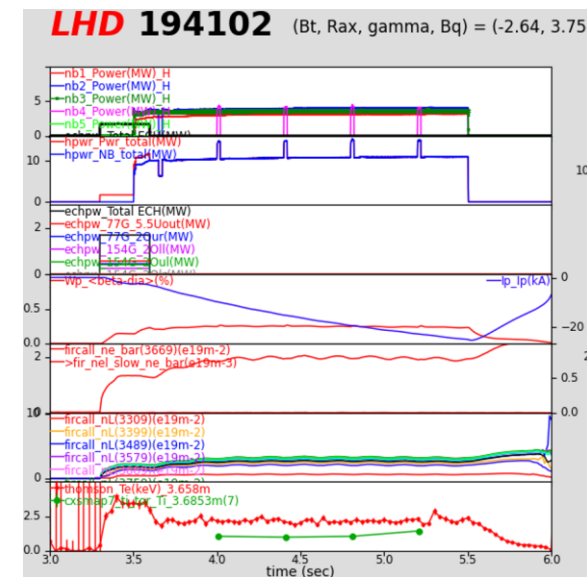
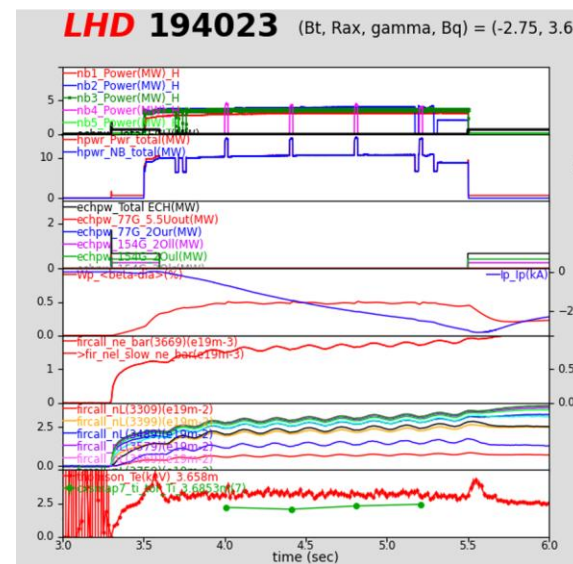
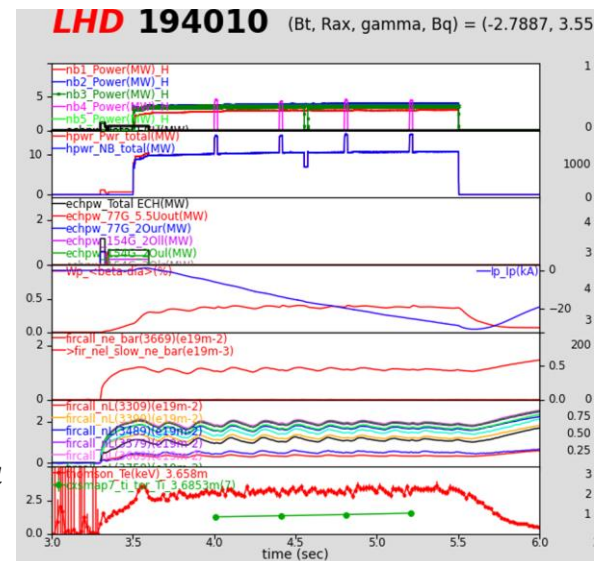
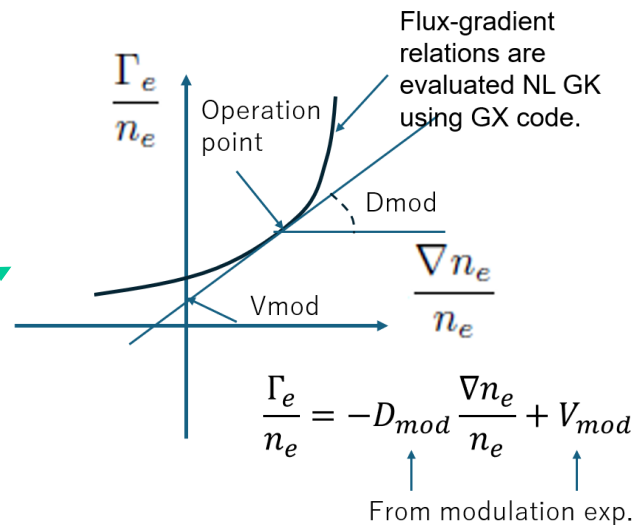
#194093 - #194106

## Motivation and method:

- We aim to validate the particle transport by using a gyro-kinetic simulation.
- Density modulation experiments with NNB heating were performed for three different configuration with different NNB power.
- The averaged density was kept  $< \sim 1.5 \times 10^{19} \text{m}^{-3}$  to stay in the ITG regime to run GK code

## Results:

- A 5Hz density modulation using pre-programmed puff was done.
- Power scan data was obtained at three configurations.



# Investigation of high-k turbulence dependence on collision frequency

T. Nasu, T. Tokuzawa, D. Nishimura

## Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.6 \text{ m}, \text{CCW}, 2.75 \text{ T}, 1.2538, 100.0\%)$   
 #194036 - #194089 (54 shots)

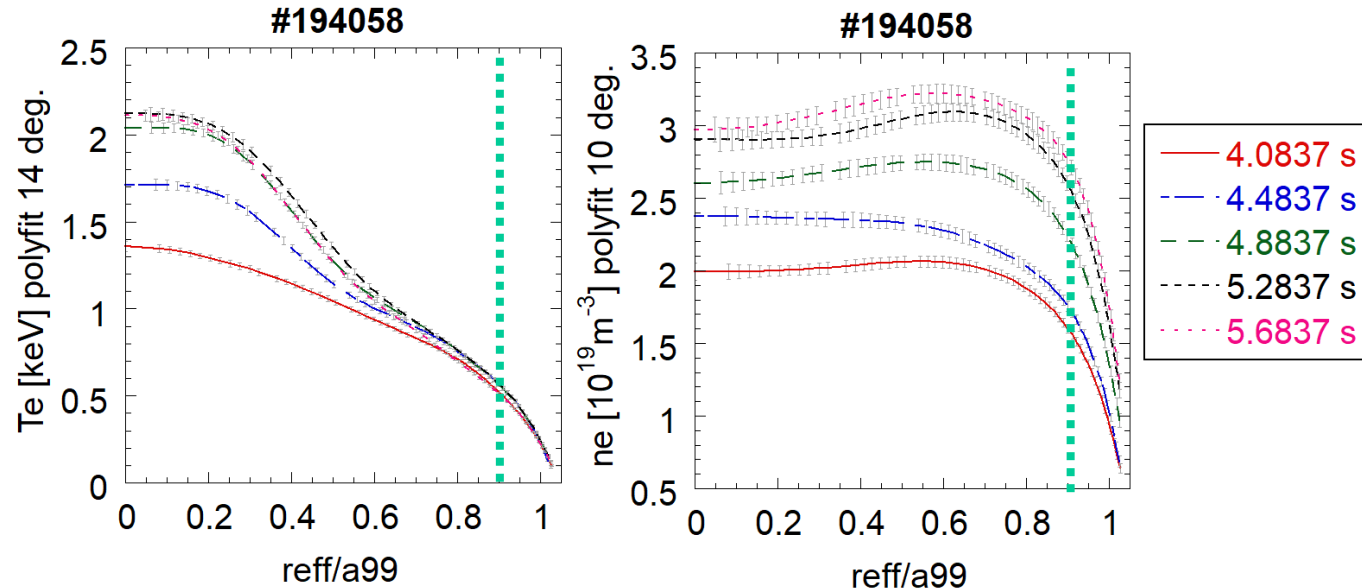
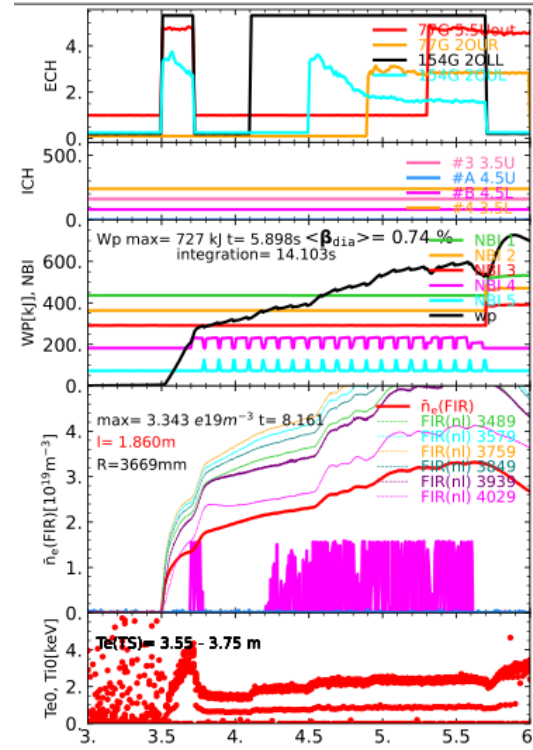
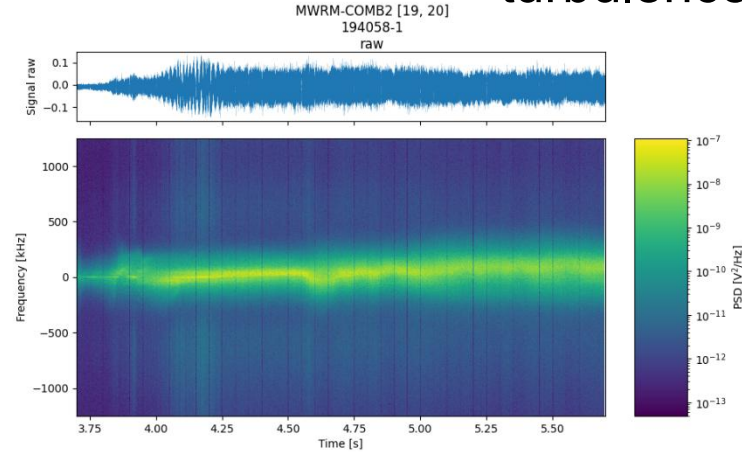
## Motivation and method:

- To reveal high-k turbulence dependence on collision frequency by scanning  $n_{e\_bar}$
- To keep  $T_e/T_i$  constant, we tried to keep ECE signal intensity constant by gas puff FB control with ECH Power scan at edge region.

## Results:

- We successfully achieved local  $n_e$  scan with constant  $T_e$  at  $\text{reff}/a_{99} > 0.5$  by this method.
- We could observe high-k turbulent fluctuation signal change at  $0.3 < \rho < 1.0$  by steering BS antenna angle.

high-k turbulence



# Measurement of Plasma Dynamics during Core Density Collapse (CDC) in LHD

## Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.85 \text{ m}, \text{CCW}, -1.2 \text{ T}, 1.2538, 100.0\%)$   
#194107 - #194127, 4~7 pellets

## Motivation and method:

- CDC causes beta loss in super dense core plasmas
- The objective is to capture the temperature and density profiles during CDC using the fast TS developed through collaborative research between UWM and NIFS.
- The test operation and acquisition of training data for the new event trigger system
  - The trigger system monitors line-averaged electron density using an interferometer

## Results:

- Successfully reproduced CDC and good real-time data collected for further trigger system training + improvement
- Follow-up experiment on Nov. 14

D. Den Hartog (U. Wisconsin), N. Kenmochi, Y. Takemura, Y. Suzuki (Hiroshima U.), A. Wright (U. Wisconsin), R. Sassella (U. Wisconsin), et al

