Daily Report for 2025-12-3

R. Yanai

Date: December 3, 2025
Time: 9:46 – 18:43
Shot: 198381 – 198531 (151 shots)
Prior wall conditioning: No
Divertor cryopump: On
Gas puff: H2, He
Pellet: No

NBI: #1, #2, #3, #4, #5
ECH: 2-OUR (77GHz), 5.5-UO (77GHz), 2-OLL (154GHz), 2-OUL (154GHz)
ICH: No injection

Topics

1. Fast ion stabilization of ETG (D. Moseev, H. Igami)
2. Investigation of Shafranov shift for high beta configurations using a new method exploiting radially localized ECE measurements (N. Chaudhary, T. Tokuzawa)
3. Search of the trigger of the ultra-high divertor pressure regime (U. Wenzel, G. Motojima)
4. Investigation of direct interaction between fast ion and turbulence (H. Sakai, T. Nakayama)

Fast ion stabilization of ETG

D. Moseev & H. Igami

Experimental conditions:
(R_{ax}, Polarity, B_t, γ, B_q) = (3.55 m, CCW, 1.375 T, 1.2538, 100.0%)
#198390 - #198401, H2 & He

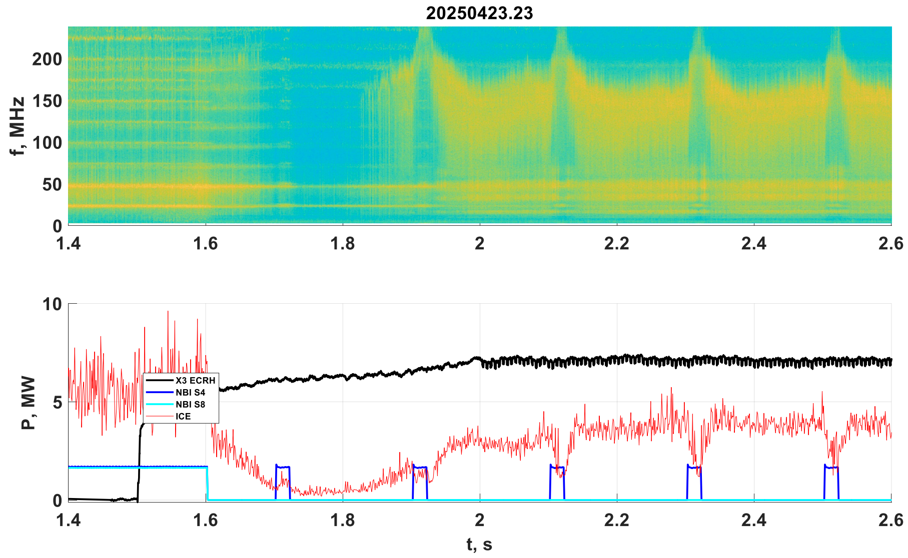
Experimental conditions:
(R_{ax}, Polarity, B_t, γ, B_q) = (3.6 m, CCW, 1.375 T, 1.2538, 100.0%)
#198403 - #198410, H2 & He

Experimental conditions:
(R_{ax}, Polarity, B_t, γ, B_q) = (3.75 m, CCW, 1.375 T, 1.2538, 100.0%)
#198412 - #198420, H2 & He

Experimental conditions:
(R_{ax}, Polarity, B_t, γ, B_q) = (3.9 m, CCW, 1.375 T, 1.2538, 100.0%)
#198427 - #19835, H2 & He

Motivation and method:
- In W7-X, a high-frequency instability (ETG by exclusion, too fast) was observed and being was stabilized by NBI blips both in H2 and He.
- In LHD, in ECRH plasma with different NBI blips and different magnetic configuration, attempted to reproduce.

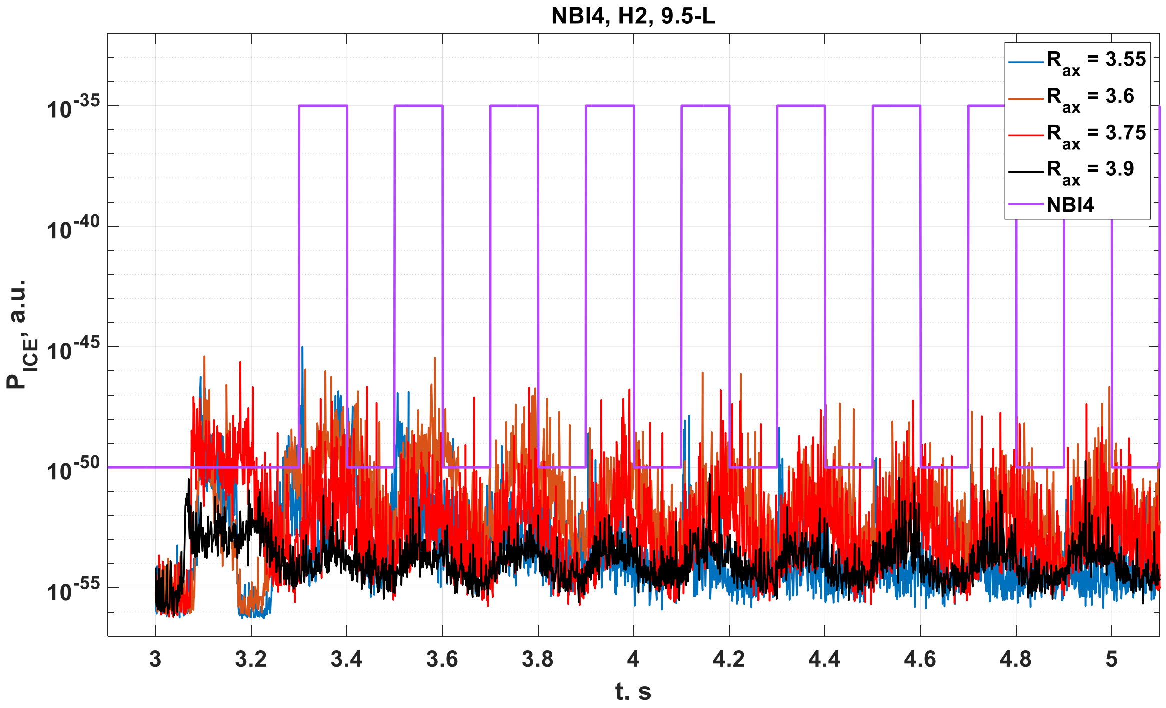
Results:
- We could not reproduce the high-frequency instability in LHD.
- ICE generally looks differently from W7-X, more bursty.
- Antenna in 10-O is more sensitive to thermal ICE. Most stable to FI ICE is config R_ax = 3.9

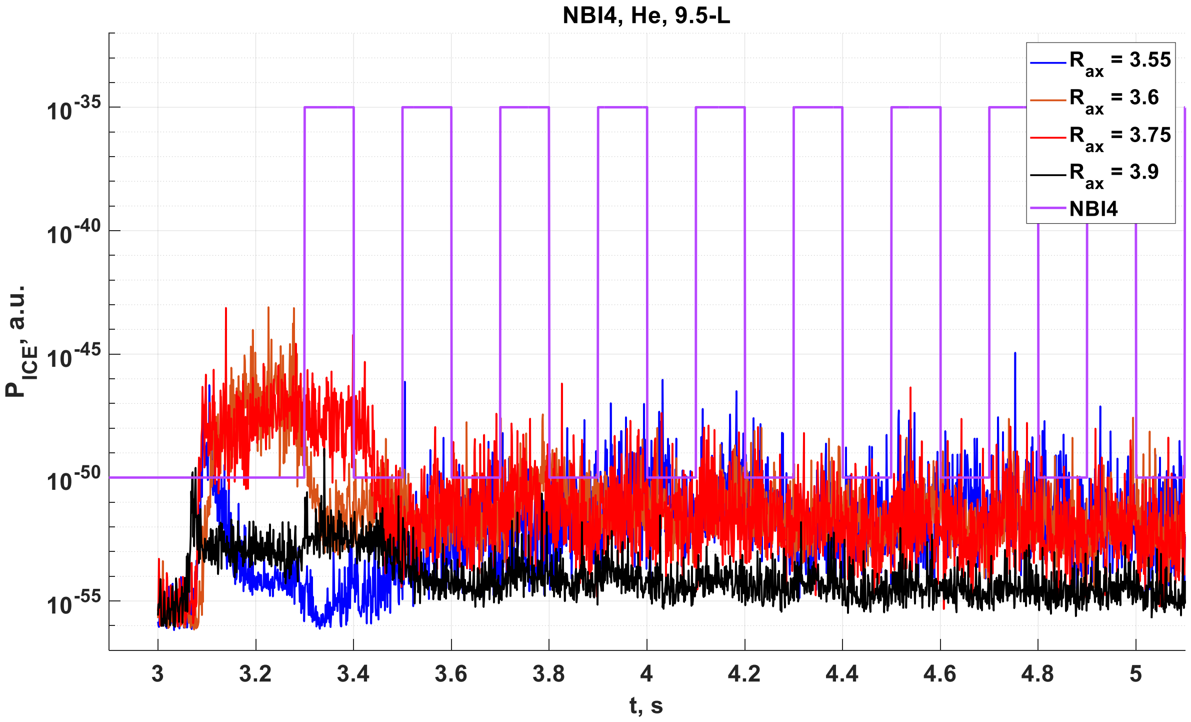


Example W7-X

Fast ion stabilization of ETG

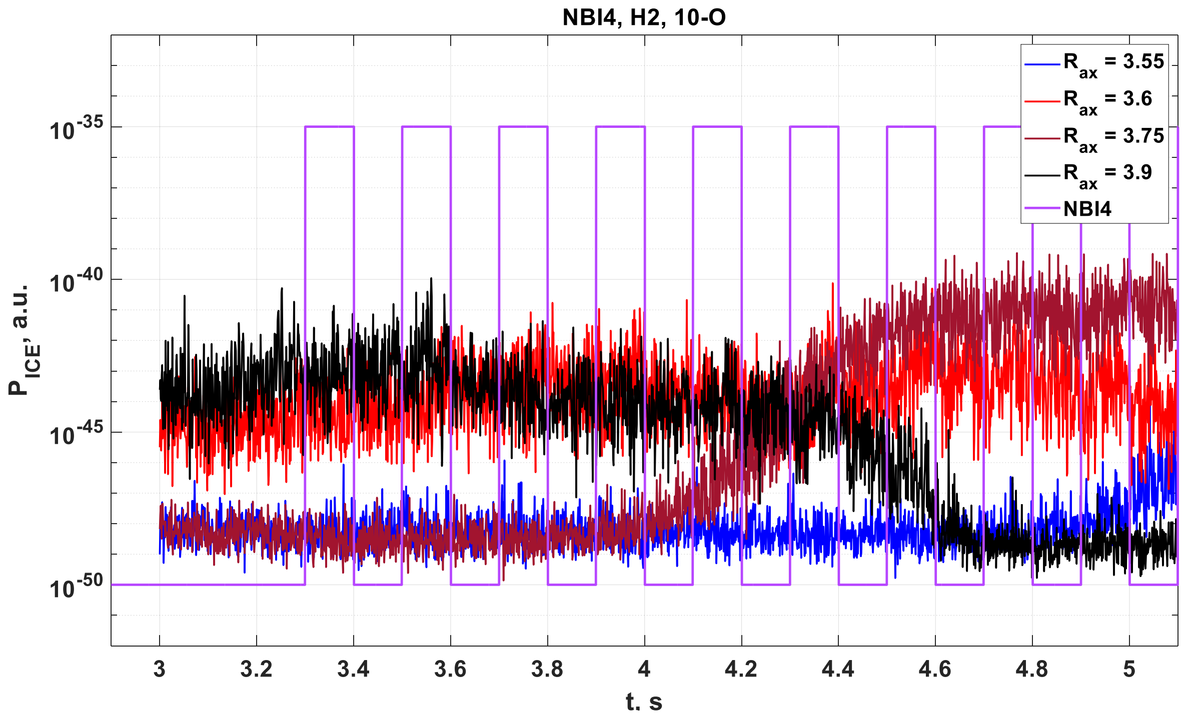
D. Moseev & H. Igami

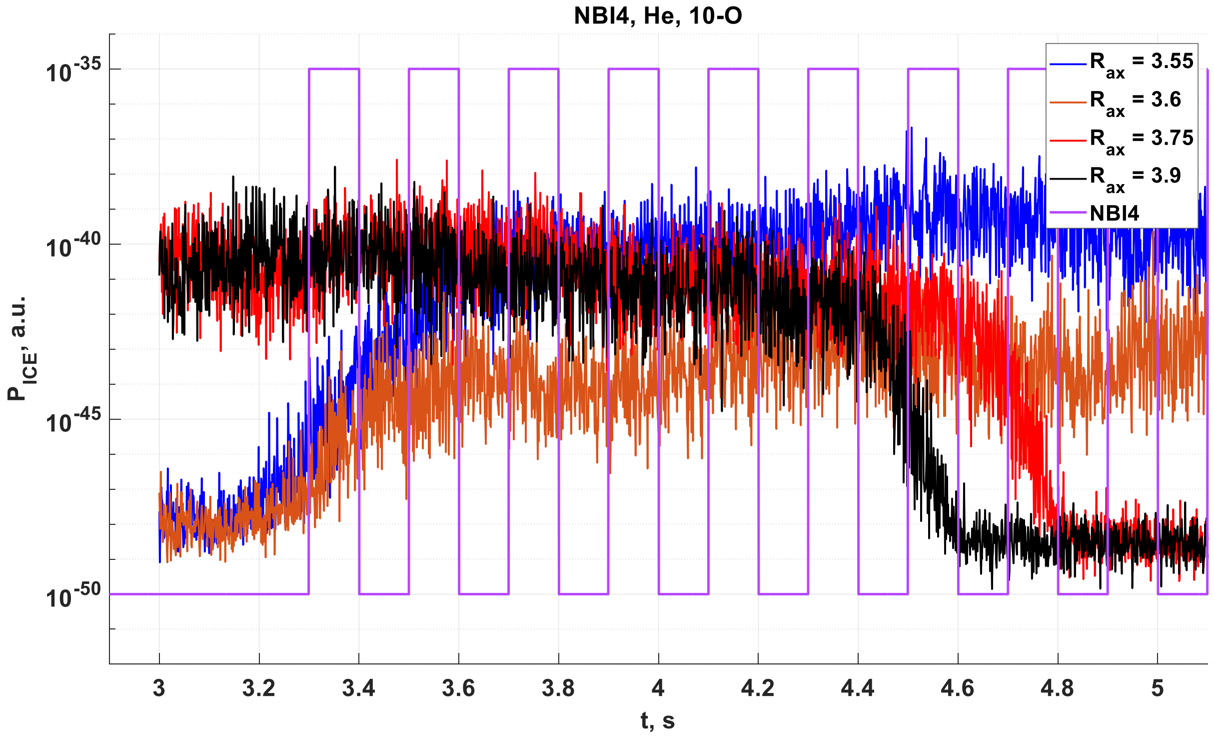




Fast ion stabilization of ETG

D. Moseev & H. Igami





Investigation of Shafranov shift for high beta configurations using a new method exploiting radially localized ECE measurements

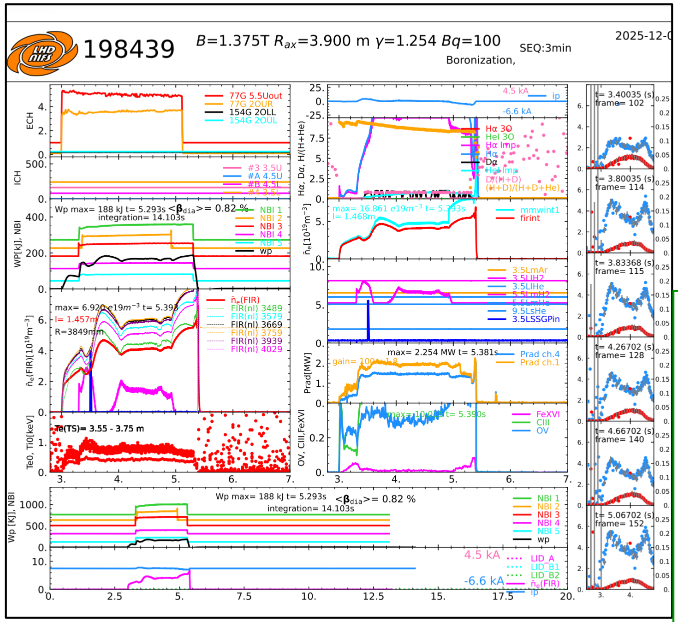
N. Chaudhary (IPP Greifswald),
T. Tokuzawa

Experimental conditions:

(R_{ax}, Polarity, B_t, γ, B_q) = (3.75 m, CW, 1.375 T, 1.2538, 100.0%) #198422 - #198426 (5 shots)
(R_{ax}, Polarity, B_t, γ, B_q) = (3.90 m, CW, 1.375 T, 1.2538, 100.0%) #198436 - #198439 (4 shots)

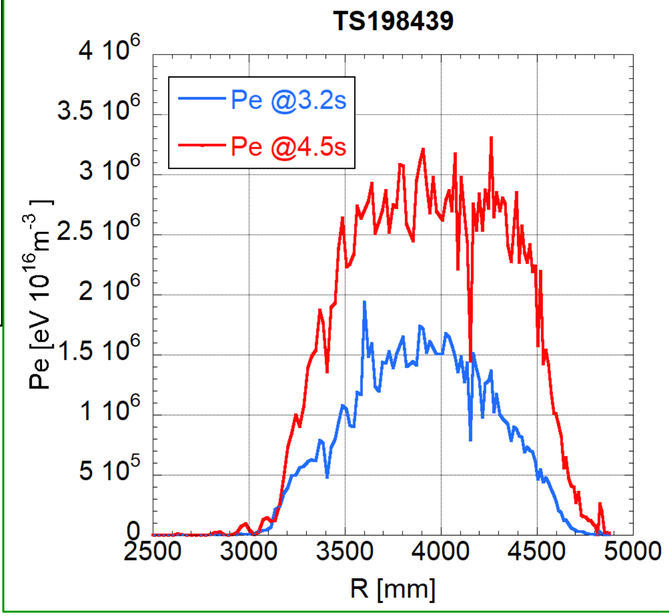
Motivation and method:

- Investigation of Shafranov shift for high beta configurations
- Probing ECE spectra for high beta plasma



Results:

- Using a SSGP injection for increasing a higher beta in core region, Shahranov shift has been successfully observed by TS in two different configuration.
- **Analysis routine to investigate Shafranov shift still needs to be executed with ECE spectrum, however, all the required data are recorded.**



Search of the trigger of the ultrahigh divertor pressure regime

U. Wenzel (IPP), G. Motojima (NIFS)

Experimental conditions:

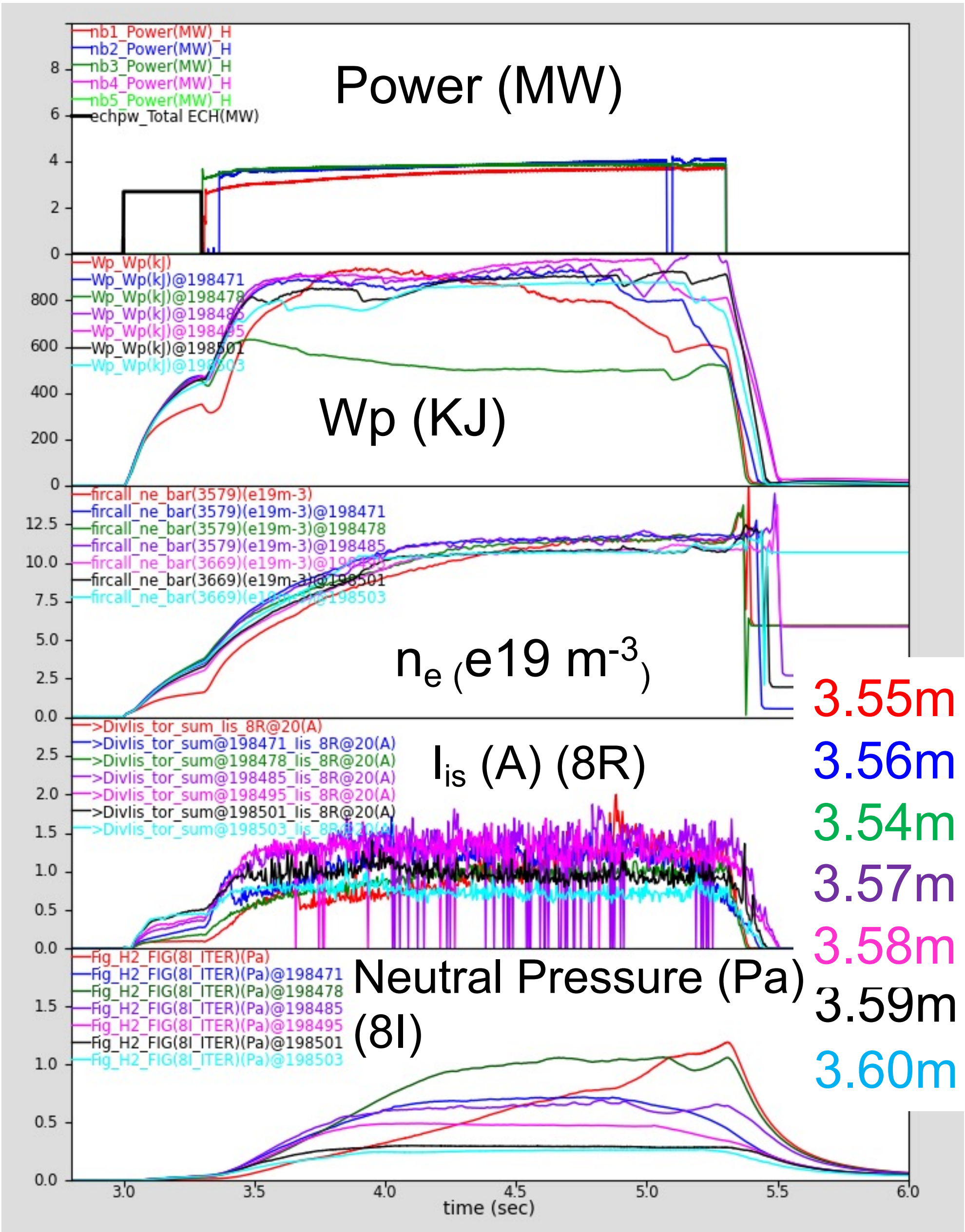
(R_{ax}, Polarity, B_t, γ, B_q) = (3.55 CW 2.7887 1.2538 100.0) #198443-198466
(R_{ax}, Polarity, B_t, γ, B_q) = (3.56 CW 2.7808 1.2538 100.0) #198467-198471
(R_{ax}, Polarity, B_t, γ, B_q) = (3.54 CW 2.7966 1.2538 100.0) #198472-198478
(R_{ax}, Polarity, B_t, γ, B_q) = (3.57 CW 2.7731 1.2538 100.0) #198479-198488
(R_{ax}, Polarity, B_t, γ, B_q) = (3.58 CW 2.7654 1.2538 100.0) #198489-198495
(R_{ax}, Polarity, B_t, γ, B_q) = (3.59 CW 2.7576 1.2538 100.0) #198496-198501
(R_{ax}, Polarity, B_t, γ, B_q) = (3.60 CW 2.7500 1.2538 100.0) #198502-198503

Motivation and method:

- To investigate the trigger mechanisms of ultra high neutral pressure in the divertor.
- Acquisition of matrix data of densities (8e19 m^{-3} and 10e19 m^{-3}) and powers scan (3tNBIs, 3tNBIs+2pNBIS)

Results:

- We obtained the data in the R_{ax} from 3.54m to 3.60m with a 1-cm step.
- Typical example is shown at 10e19 m^{-3} and 3tNBIs.
- Neutral pressure is dependent on the R_{ax} (Maximum pressure at R_{ax} = 3.55m).
- The relation will be investigated about the pressure with stored energy, divertor flux, radiation power, etc.



Investigation of direct interaction between fast-ion and turbulence

H. Sakai (QST), T. Nakayama (Tottori-Univ.)

Experimental conditions:
(R_{ax}, Polarity, B_t, γ, B_q) = (3.6 m, CW, 2.75 T, 1.2538, 100.0%)
#198504 – #198531
Rescheduling the experiment on 11/21

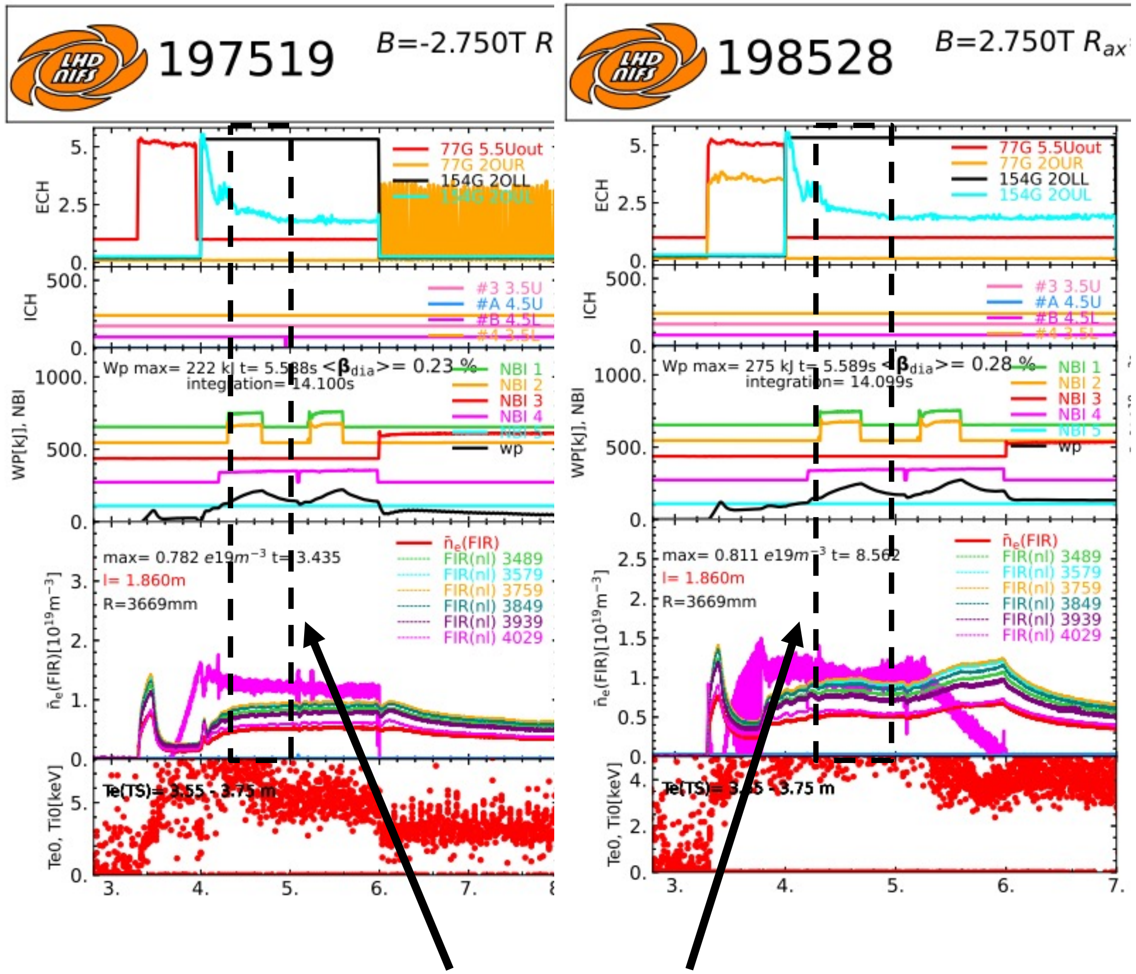
Motivation and condition:

- Investigating the effects of fast ions on turbulence to compare CW exp.
- NBI modulation, Power scan, Pulse-width scan, Density scan, and Heating-energy change were performed.

Results:

- NB#2 was not in good condition, but was able to be injected.
- The heating is set so that the current drive direction is the same as the magnetic field direction between 11/20 and 12/3.
- The experiment was carried out under identical conditions with opposite magnetic field polarity.
- Analyses of turbulence and energetic particle measurements will be conducted

11/20 (previous day) 12/3 (this day)



Focused time duration in these experiment series