

# (TG2) Turbulence Topical Group Report

Date: Feb. 15, 2022

Feb. 16, 2022 (T. Tokuzawa)

Time: 11:28 - 13:25

Shot#: 178931 – 178969 (39 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(4.5, 1.7, 2.3, 3.8, 3.1)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(979, 930, 986)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 =  $9.4 \times 10^{10}$

## Remarks

8-I divertor cryo pump could not work

## Topics

1. Observation of low frequency oscillation in ion velocity distribution with ECH injection (M. Yoshinuma)
2. Study of turbulence pulse properties during the minor collapse events of e-ITB (N. Kenmochi)

# Observation of low frequency oscillation in ion velocity distribution with ECH injection

M.Yoshinuma, K.Ida

## Experimental conditions (#178933 - #178969):

(Rax, Polarity, Bt,  $\gamma$ , Bq) = (3.53m, CCW, 2.8045 T, 1.2538, 100.0%)

## Motivation and Objective:

Low-frequency oscillations have been observed in ECE measurements due to ECH injection in low-density plasmas.

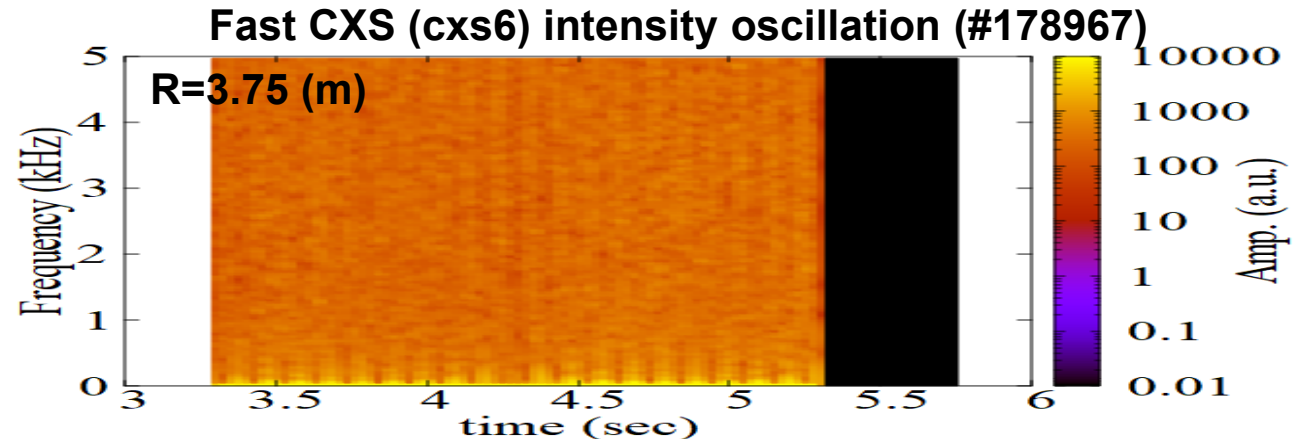
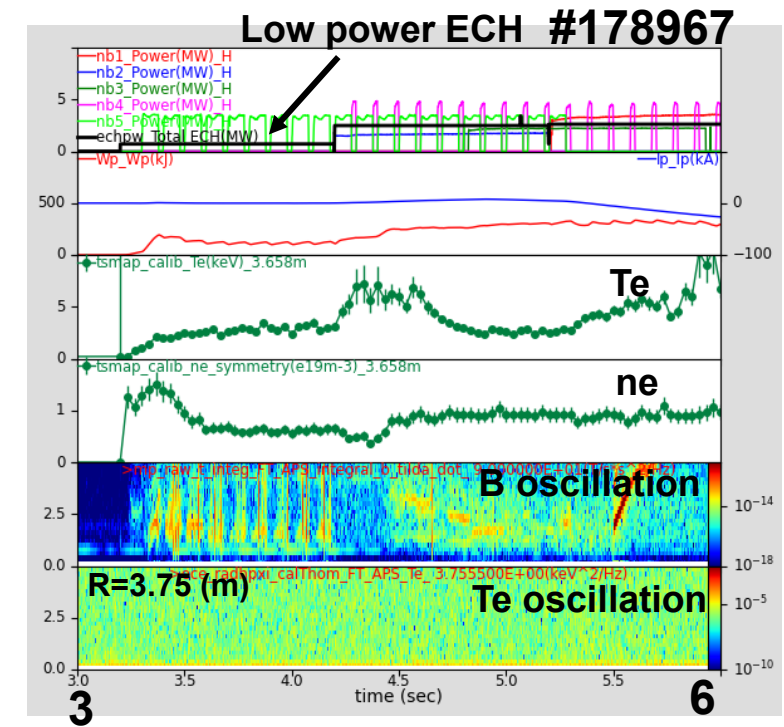
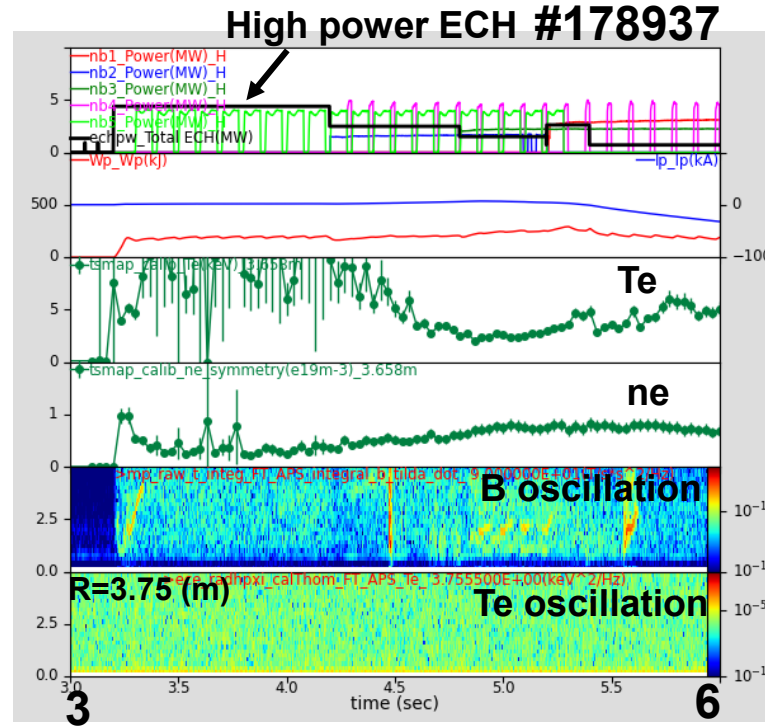
We investigate whether the ion velocity distribution changes with the occurrence of the low-frequency mode.

## Experiments:

Empirically, the mode is observed in low-density plasmas with ECH heating in an inward shifted magnetic configuration.

ECH power was changed in order to find the condition where the low-frequency oscillation is observed.

Low frequency oscillation was observed in the magnetic probe signal with low power injection of ECH while no corresponding oscillation is observed in ECE signal. And no oscillation is observed in the intensity of fast CXS spectrum. We will check the result of the moment analysis.



# Study of turbulence pulse properties during the minor collapse events of e-ITB

(N. Kenmochi)

## Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.53 \text{ m}, \text{CCW}, 2.804 \text{ T}, 1.2538, 100.0\%)$

Co. to Ctr. current drive at center region (#178931 - #178969), Hydrogen plasma

**Objective:** To investigate turbulence pulse properties during the minor collapse events of e-ITB.

## Results:

- ✓  $D/(H+D) = 0.1$
- ✓ Minor collapse of eITB was observed.
- ✓ The **electron-scale turbulence** and **magnetic fluctuation** rapidly increase simultaneously.
- ✓ High-speed Thomson scattering (20 kHz) measurement was successfully operated.
- ✓ The measurement position of e-scale turbulence was scanned in a shot-to-shot basis.
- ✓ The turbulence pulse properties considering the relationship between  $T_e$  profile, heat pulse will be investigated.

