

(TG4) Plasma instability group report

Date: Nov. 17, 2022

Nov. 18, 2022 (K. Nagaoka)

Time: 16:20 - 18:45

Shot#: 183721-183768 (48 shots)

Prior wall conditioning: D2 glow

Divertor pump: On

Gas puff: H₂/D₂, Pellet: No

NBI#(1, 2, 3, 4, 5)=gas(D, D, D, D, D)=P(2.2, 2.2, 2.2, 5.5, 8.7)MW

ECH(56GHz)=ant(1.5-U)=P(0)MW

ECH(77GHz)=ant(5.5-U, 2-OUR)=P(0.7, 0.8)MW

ECH(154GHz)=ant(2-OLL, 2-OUL, 2O-LR)=P(0.7, 0.8, 0.8)MW

ICH(3.5U, 3.5L, 4.5U, 4.5L) = P(0, 0, 0, 0)MW

Neutron yield integrated over experiment = (1.3E+17)

Topics

1. Observation of whistler frequency waves excited by nonlinear wave-wave coupling during abrupt bursting events (H. Igami)

Observation of whistler frequency waves excited by nonlinear wave-wave coupling during abrupt bursting events

H. Igami

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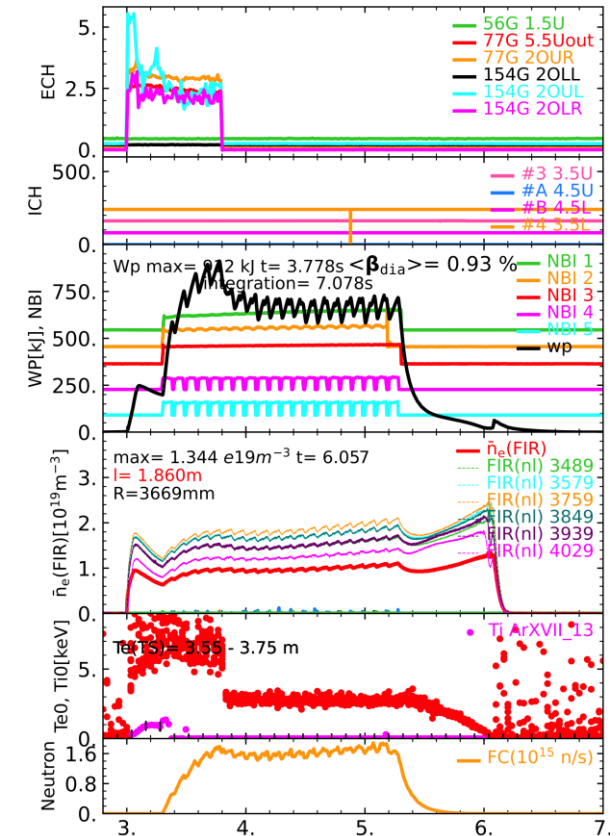
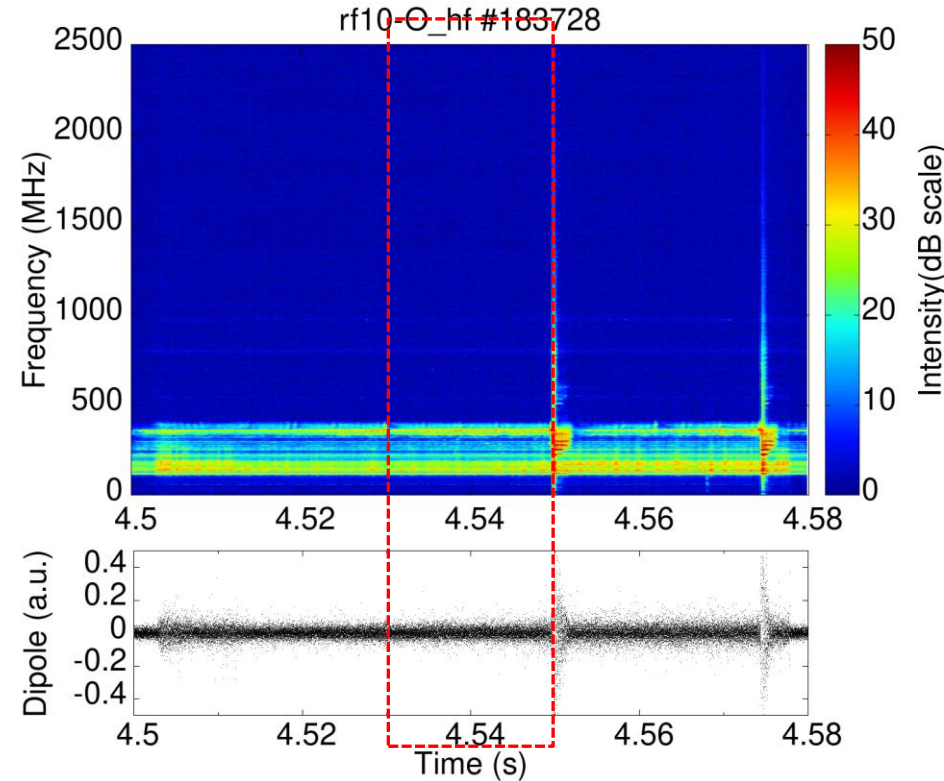
Experimental conditions: $(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.6 \text{ m}, \text{CCW}, 2.75 \text{ T}, 1.2538, 100.0\%)$

Purpose:

- Investigation of wave-particle and wave-wave coupling during the RF burst that appears with the “tongue” from ion-cyclotron to electron cyclotron frequency range
- Investigation of dependency of the peak frequency intensity of ICE originated fusion born protons with change of neutron flux

Experimental result:

- Intense RF waves were detected at 9.5-L and 10-O RF antennas for wide frequency range



Data acquisition by
ECE-U-fast (80 Gs/s)

Observation of whistler frequency waves excited by nonlinear wave-wave coupling during abrupt bursting events

Experimental result:

- In KSTAR, “bursting” intense ECE was detected during magnetic reconnection by ELM, however, no intense signal has not been detected yet in ECE acquired by Ultra fast ECE (80 Gs/s) oscilloscope during the RF burst

