

(TG4) Plasma instability group report

Date: Dec. 19, 2022

Dec. 20, 2022 (R. Seki)

Time: 13:45 – 16:00

Shot#: 186407-186445 (39 shots)

Prior wall conditioning: No

Divertor pump: On

Gas puff: H₂ Pellet: No

NBI#(1, 2, 3, 4, 5)=gas(H, H, H, H, H)=P(0.0, 3.1, 3.0, 3.6, 4.0)MW

ECH(77GHz)=ant(5.5-Uout (or 1.5U), 2-OUR)=P(0.333, 0.0)MW

ECH(154GHz)=ant(2-OLL, 2-OUL, 2-OLR)=P(0.398, 0.601, 0.602)MW

ECH(56GHz)=ant(1.5U)=P(0.0)MW

ICH(3.5U, 3.5L, 4.5U, 4.5L)=P(0.0, 0.0, 0.0, 0.0)MW

Neutron yield integrated over experiment = 1.5×10^{13}

Topics

1. Isotope dependence of collisionless energy transfer from beam to bulk ions (K. Ida)

Isotope effect of collision-less energy transfer from wave to particle

Shot #: 186408- 186445

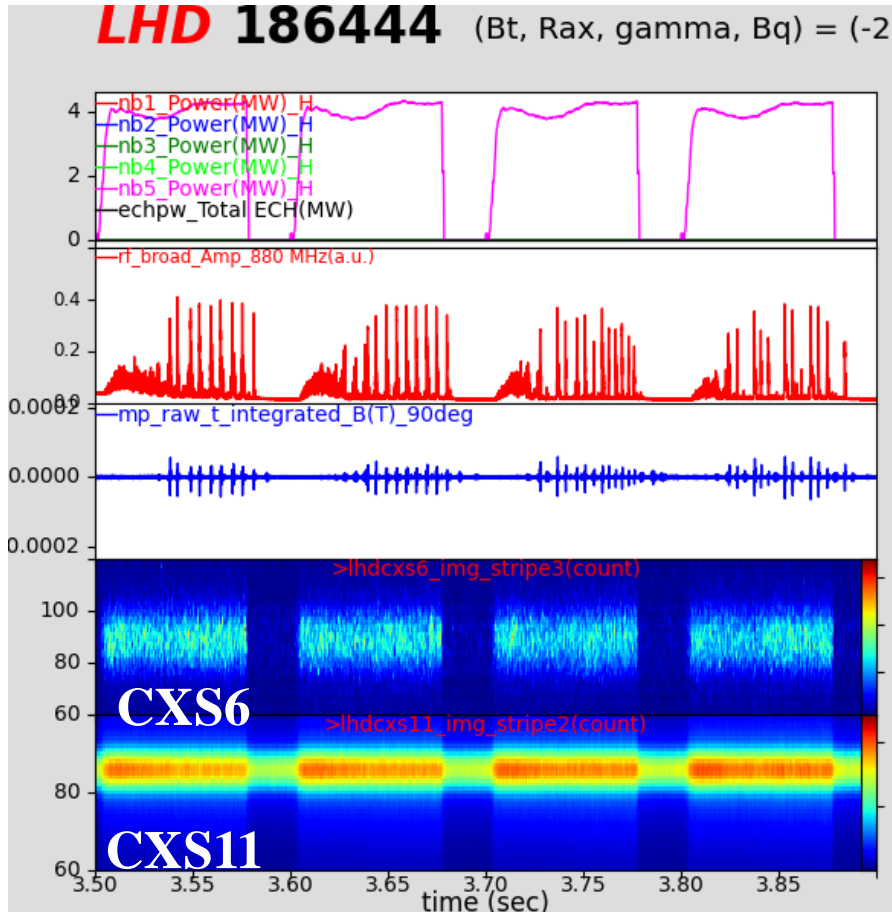
K.Ida and M.Yoshinuma

Experimental conditions: $(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.55 \text{ m}, \text{CCW}, 2.7887 \text{ T}, 1.2538, 100 \%)$

Motivation and objective:

To investigate the isotope effect of collision-less energy transfer from wave to particle – difference in deformation of ion velocity distribution associated with MHD burst.

$$n_e = 0.3 \times 10^{19} \text{m}^{-3}$$



Results:

MHD burst is also observed with perpendicular hydrogen beam by decreasing the electron density to $0.3 \times 10^{19} \text{m}^{-3}$

The frequency of MHD burst becomes higher, and the deformation of ion velocity distribution becomes small.

Conditioning average is necessary to detect the difference between H-beam and D-beam.

MHD burst with Deuterium perpendicular beam

$$n_e = 0.6 \times 10^{19} \text{m}^{-3}$$

