

(TG4) Plasma instability group report



Nov. 30, 2021 (N. Kenmochi)

Date: Nov. 26, 2021

Time: 13:25 - 15:45

Shot#: 173587 – 173630 (44 shots)

Prior wall conditioning: No

Divertor pump: OFF

Gas puff: D₂, Pellet: No

NBI#(1, 2, 3, 4, 5)=gas(D, D, D, D, D)=P(2.3, 2.2, 2.5, 6.5, 4.8)MW

ECH(77GHz)=ant(5.5-Uout (or 1.5U), 2-OUR)=P(0.33, 0.37)MW

ECH(154GHz)=ant(2-OLL, 2-OUL, 2-OLR)=P(0.30, 0.36, 0.34)MW

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

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

Neutron yield integrated over experiment = 1.0×10^{17}

Topics

Investigation of the beam-beam fusion fraction (H. Nuga)

Investigation of the beam-beam fusion fraction

Shot #: 173587-173630 (44 discharges)

H. Nuga

Experimental conditions:

$(R_{ax}, \text{Polarity}, B_t, \gamma, B_q) = (3.6 \text{ m}, \text{CW}, 2.75 \text{ T}, 1.254, 100 \%)$

Background and motivation:

- In LHD, due to the presence of the high injection energy (~ 180 keV) NBI system, the fusion reaction between fast deuterons is not negligible.
- The estimation of the ratio of beam-beam (bb) fusion is important for EP driven instability studies.
- Aim of this exp. is taking reference data for the bb fusion estimation

Summary:

- Systematic dataset for bb fusion estimation was taken.
- Density scan with 3 beam patterns (NB#1+NB#2, NB#1+NB#3, NB#1+NB#5) was performed.
- Density scan range is $0.5e19 < ne < 3e19$
- BB fusion fraction will be surveyed against the fast-ion slowing down time.

