(TG4) Plasma instability group report

Nov. 22, 2022 (R. Seki)

Date: Nov. 18, 202
Time: 9:42 -13:23
Shot#: 183770-183834 (65 shots)

Prior wall conditioning: No

Divertor pump: off
Gas puff: D2, Ar Pellet: No
NBI#(1, 2, 3, 4, 5)=gas(D, D, D, D, D)=P(1.9, 1.6, 2.2, 7.6, 6.7)MW
ECH(77GHz)=ant(5.5-Uout (or 1.5U), 2-OUR)=P(0.703, 0.792)MW
ECH(154GHz)=ant(2-OLL, 2-OUL, 2-OLR)=P(0.723, 0.799, 0.825)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 = 7.1×10^{16}

Topics

1. Measuring the dependence of ion cyclotron emission on fast ion density and energy (J. Lestz, K. Saito)

Measuring the dependence of ion cyclotron emission (ICE) on fast ion energy and density

- **Shots**: 183779 - 183834
- **Conditions**: $R_{ax} = 3.6$ m, $B = 1.375$ T and $B = 2.75$ T (CCW). $n_e = 1 - 5 \cdot 10^{-19}$ m^{-3}. D thermal and beam ions. Varied NB4/5 voltage (38 - 60 keV) & current (25 - 100 A).
- **Motivation**: ICE is a potential passive diagnostic for fast ions in future burning plasmas. Must fully understand the instability in order to extract useful diagnostic information.
  - Last campaign: varied thermal plasma parameters
  - New data: varied beam (fast ion) parameters
- **Results**: scanned perpendicular NBI current at constant voltage and voltage at constant current.
  - ICE activity increased during an NB4 current scan. Trends to be compared to theoretical models.