(TG2) Turbulence Topical Group Report

Date: Dec. 15, 2022
Time: 14:45 - 16:45
Shot#: 186174 – 186209 (36 shots)

Dec. 16, 2022 (T. Kobayashi)

Prior wall conditioning: NO
Divertor pump: YES
Gas puff: H2 Pellet: NO
NBI#(1, 2, 3, 4, 5)=gas(H, H, H, H, H)=P(2.1, 3.1, 3.1, 4.5, 4.7) MW
ECH(77GHz)=ant(5.5-U, 2-OUR)=P(703, -)kW
ECH(154GHz)=ant(2-OLL, 2-OUL, 2O-LR)=P(-, -, -) kW
ECH(116GHz)=ant(2O-LR)=P(-)kW
ECH(56GHz)=ant(1.5-U)=P(-)kW
ICH(3.5U, 3.5L, 4.5U, 4.5L) = P(-, -, -, -) MW
Neutron yield integrated over the experiment = 1.3×10^{13}

Topics

1. Correlation between density and magnetic fluctuation in high-beta plasma (T. Kinoshita*, K. Tanaka, and H. Sakai*, (*Kyushu University))

Correlation between density and magnetic fluctuation in high-beta plasma

T. Kinoshita(Kyushu Univ.), K. Tanaka, H. Sakai (Kyushu Univ.)

Shot No: #186174~186209　(36shots)
Experimental conditions
(R_{ax}, Polarity, B_t, γ, B_q) = (3.6 m, CW, 1.375 T, 1.2538, 100 %)
Gas-puff: H2

Background & Motivation

We found turbulence transition from ITG to Resistive Interchange (RI) turbulence with increasing electron density. RI is a type of MHD instability, and information of magnetic fluctuations will support being RI.

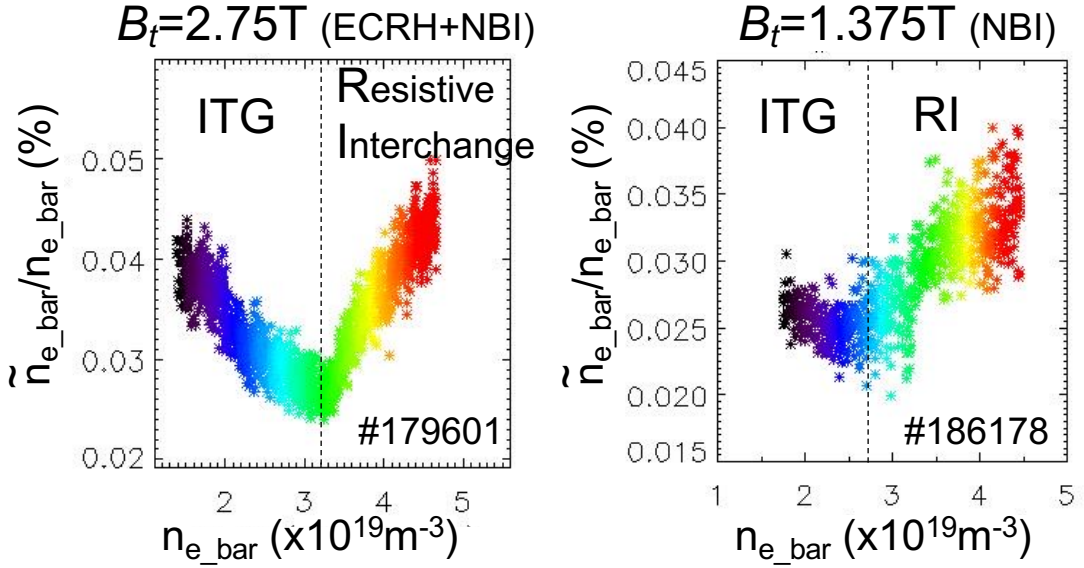
Approach

・Density ramp-up experiments and shot-by-shot density scan experiment in high-beta plasma.

Results

・Similar density dependence of turbulence were found in density ramp-up experiments at B_t=2.75T and 1.375T.
・Coherent magnetic fluctuation was observed.
・Clear correlation between density and magnetic fluctuation in RI dominant density regime was found.

turbulence behavior



density and magnetic fluctuation