Instability & Anisotropy (IA) Session Report

Apr. 16, 2024 (M. Goto)

Date: Apr. 12, 2024
Time: 13:45 – 16:45
Shot#: 189518 – 189567 (50 shots)
Prior wall conditioning: None
Divertor pump: Off
Gas puff: H2
Pellet: None
NBI#(1, 2, 3, 4, 5)=gas(H, H, H, H, H)=P(4.6, 4.2, 4.4, 4.1, –) MW
ECH(77GHz)=ant(5.5U-Out, 2O-UR)=P(0.698, 0.380) MW
ECH(154GHz)=ant(2-OLL, 2-OUL, 2-OLR)=P(0.705, 0.889, 0.982) MW

Topic:

1. Observation and control of the electron cyclotron mazer instability (H. Igami)

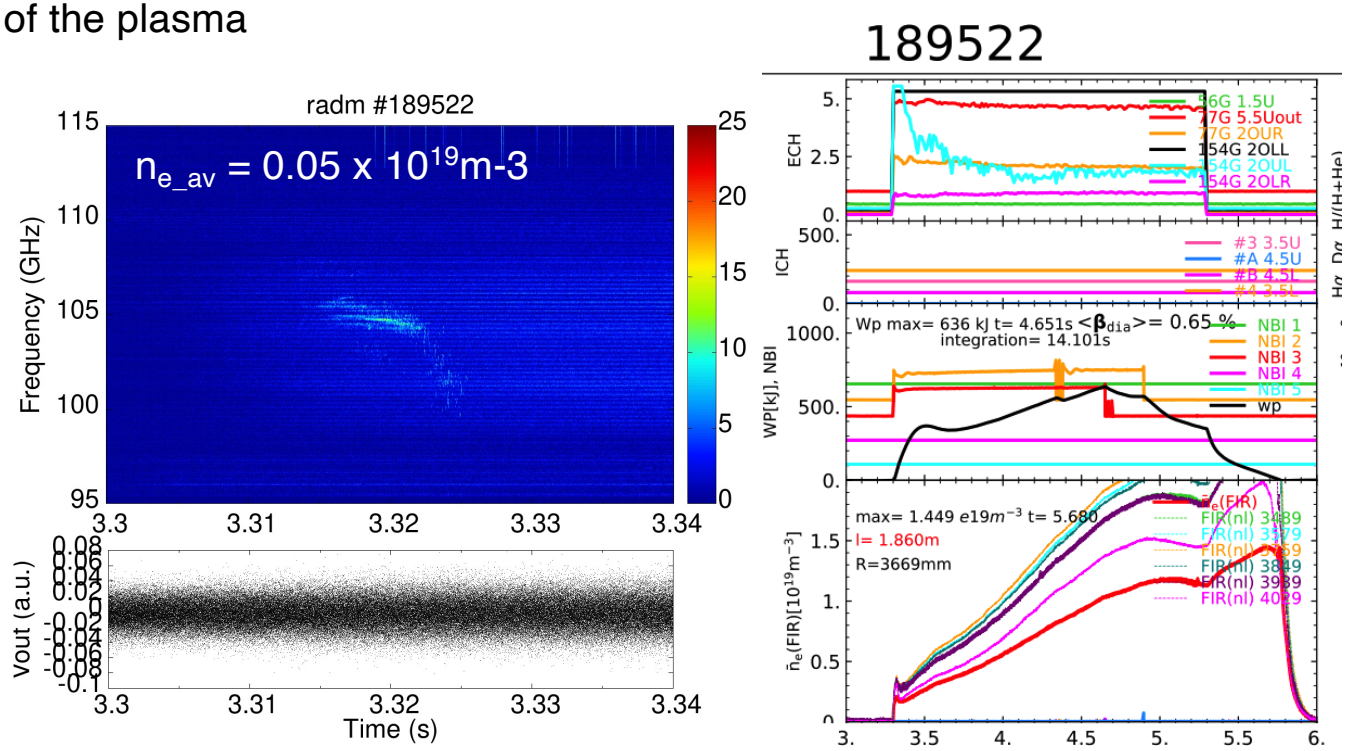
Observation and control of the electron cyclotron mazer instability. (H. Igami et al)

Shot #: 189519-189567 Magnetic configuration: (R_{ax}, Polarity, B_t, γ, B_q) = (3.60, CCW, 2.75, 1.2538, 100), (3.90, CCW, 2.63, 1.2538, 100),

Background and motivation:

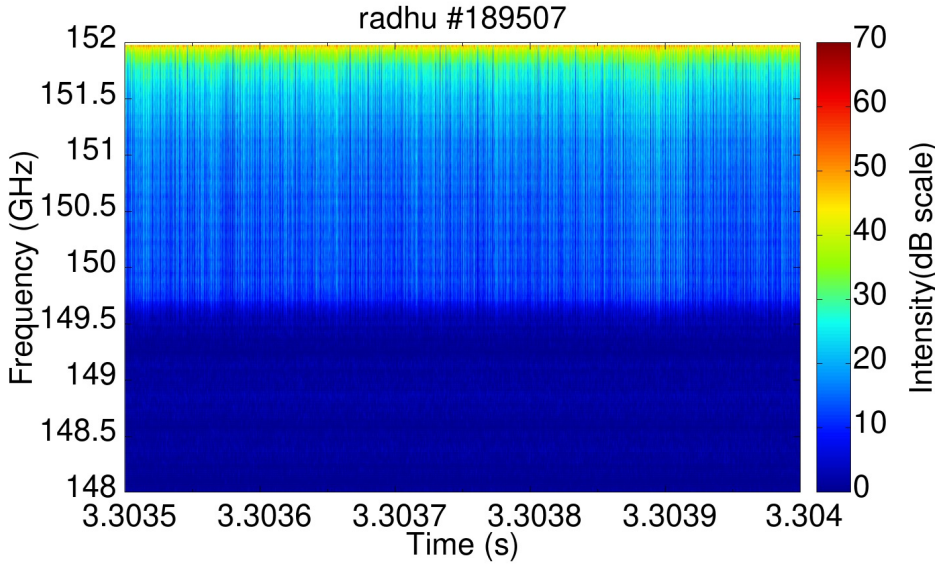
- Electron cyclotron mazer instability (ECMI) is thought to be excited in auroral accelerated region where the inversion electron velocity distribution is formed
- ECRH/ECCD can deform the electron velocity distribution
- The motivation is to investigate the effect ECRH condition and magnetic configuration on non-thermal electron cyclotron wave including ECMI

Intense bursty emissions with frequency sweeping were observed apart from the ECR (1st 77GHz, 2nd 154 GHz) frequency at the start-up phase of the plasma

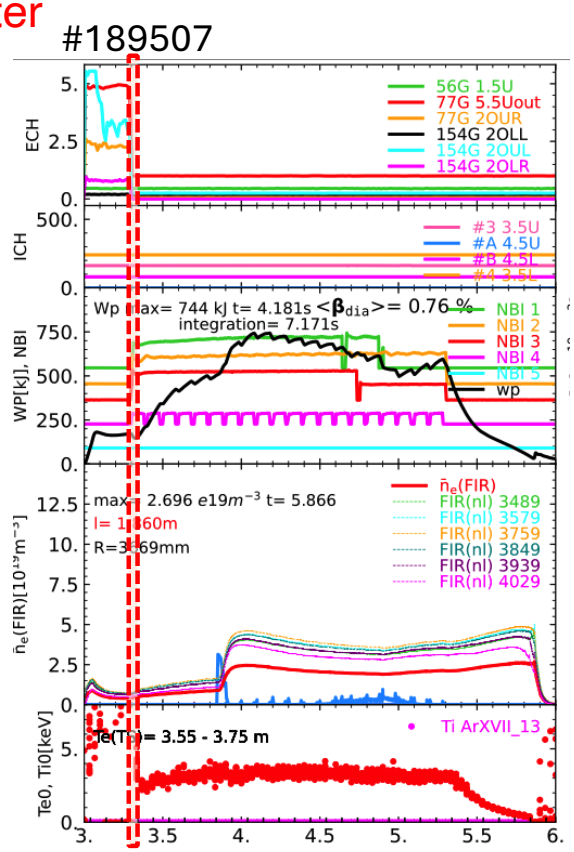


Observation and control of the electron cyclotron mazer instability. (H. Igami et al)

Very intense bursty emissions were observed at f ≳ 150 GHz even after turning off the ECRH at 3.30s. (even at 40 ms later from turning off)



For different shot of large n_{e_av} , intensity of this type emission is reduced



There are no 2nd f_{ECR} ≳ 150 GHz (rho=0.1155) along the ECE view-line
High energy electrons which exist at rho < 0.1155 might fulfill relativistic ECR condition : $\omega - n\Omega_{ce}\gamma^{-1} = 0, (\gamma^{-1} = \sqrt{1-(v/c)^2}$
and cause bursty emissions