

(IA) Instability and Anisotropy group report

Jun. 4, 2024 (R. Seki)

Date: May. 31, 2024

Time: 10:30 - 14:20

Shot#: 192376 –192453 (78 shots)

Prior wall conditioning: OFF

Divertor pump: on

Gas puff: H₂, CH₄ Pellet: no

NBI#(1, 2, 3, 4, 5)=gas(H, H, H, H, H)=P(4.5,4.1,4.2,3.9,3.9)MW

ECH(56GHz)=ant(1.5-U)=P(-.)MW

ECH(77GHz)=ant(5.5-U, 2-OUR)=P(0.698, 0.38)MW

ECH(154GHz)=ant(2-OLL, 2-OUL, 2O-LR)=P(0.705, 0.806, 0.475)MW

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

Topics

1. Phase-space tomography experiment for MHD burst event. (T. Kobayashi)
2. Compare trapped electron modes in W7-X and LHD. (A. Krämer-Flecken, T.Tokuzawa)

Interaction between GAM and turbulence (T. Kobayashi, M. Yoshinuma, Y. Kawachi, K. Ida)

Experimental conditions: (R_{ax} , Polarity, B_t , γ , B_q)

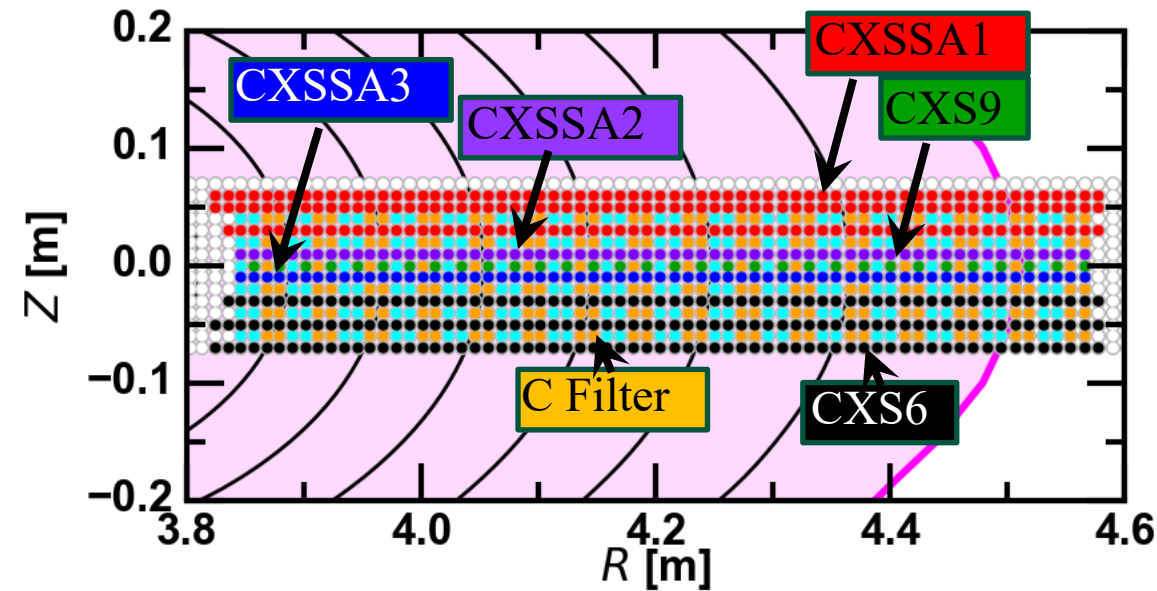
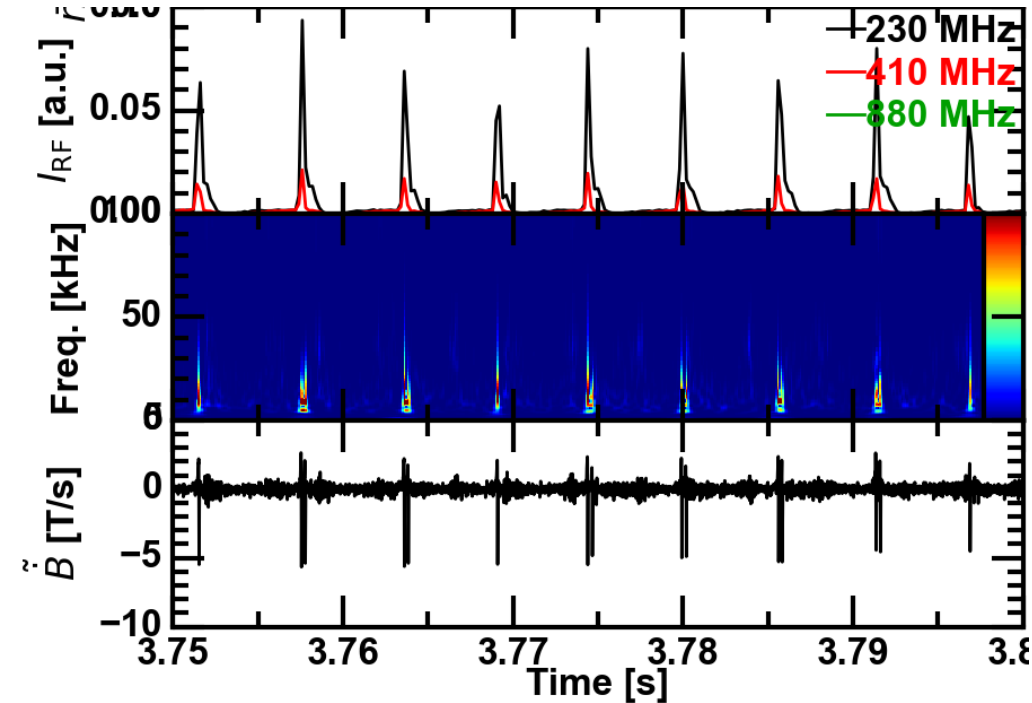
= (3.55 m, CW, 2.79 T, 1.2538, 100.0%) #192376- #192429

Aim:

- Experimental observation of phase-space perturbation structure using multimodal diagnostics

Results:

- Energetic particle driven MHD burst events were successfully observed.
- Different kinds of carbon charge exchange spectrometer systems (CXSS9, CXSS6, CXSSA1, CXSSA2, CXSSA3, and C-Filter) with a tailored arrangement were operated.
- Approximately 50 ensembles of events were obtained in a single discharge.
- Totally 33 shots for averaging were obtained (192397-192429).
- With an aid of conditional averaging, phase-space tomography will be applied for estimating the phase-space fluctuation structure.



Investigation of Quasi Coherent Modes indicating Trapped Electron Modes in LHD (A. Krämer-Flecken (FZJ), T. Tokuzawa)

Experimental conditions:

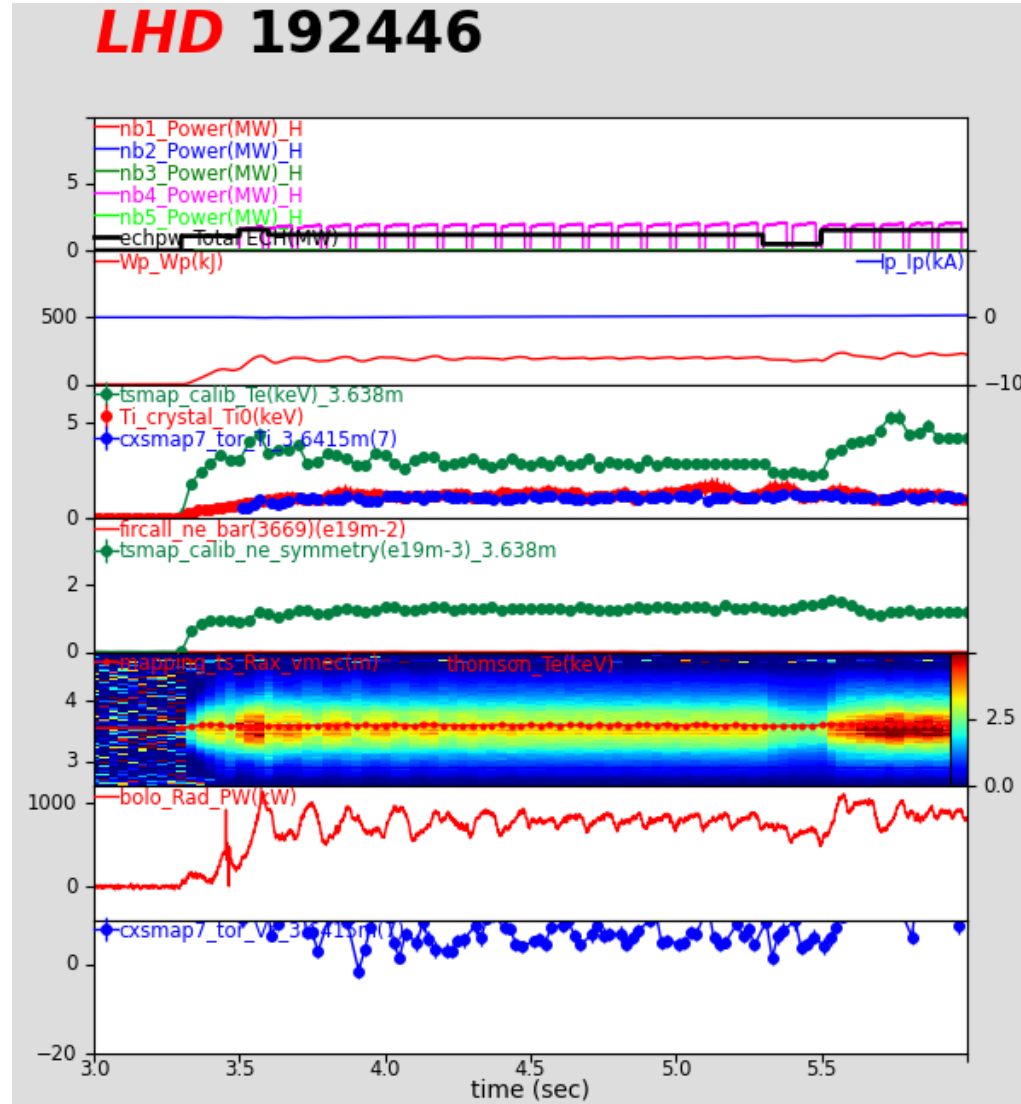
(R_{ax} , Polarity, B_t , γ , B_q) = (3.55 m, CW, 2.7887T, 1.2538, 100.0%), $n_e = 1 \times 10^{19} \text{ m}^{-3}$.

Motivation and objective:

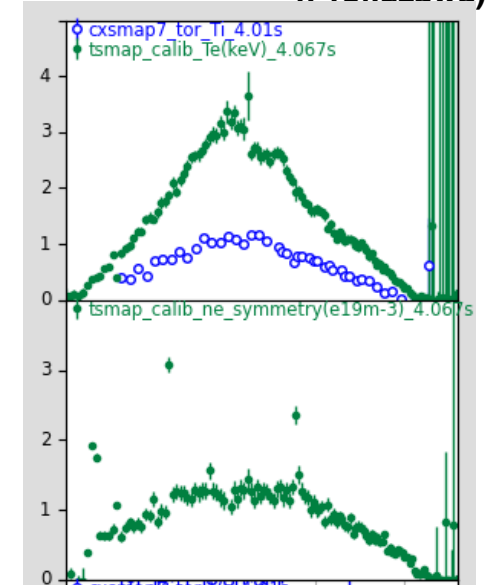
- Experiment was planned as comparison between W7-X and LHD. Condition for TEM: $T_e > T_i$. Achieved by an ECH-power scan at low density. Compare QC-mode frequencies and pol. rotation with results obtained at W7-X.

Results:

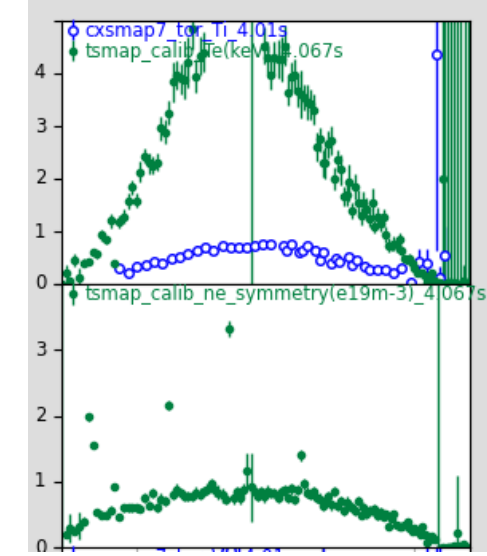
- Power scan performed at 2 densities for $0.45 \text{ MW} < P_{\text{ECH}} < 3.1 \text{ MW}$.
- Condition $T_e > T_i$ fulfilled with central T_e ranging from 7Kev to 4Kev.
- Modulation of P_{rad} for the lowest power steps observed together with an asymmetry in the core T_e -profiles. Suggest possible MHD activity.
- Replacement of ECRH by NBI not completely successful.



Overview of discharge parameters for 1922446, showing the modulation in P_{rad} for $P_{\text{ECH}}=1.15 \text{ MW}$



T_e , n_e -Profiles 192446



T_e , n_e -Profiles 192433