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EX/P7-24: Time-resolved Evolution of Low Frequency Electrostatic Fluctuations during Slow L-H Transition at the Boundary Plasma of HL-2A Tokamak

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A quasi-period electrostatic oscillation with 2-3 kHz is observed using Langmuir probe array during slow L-H transition in edge plasma of HL-2A Tokamak. This low frequency oscillation radially propagates inwards with 0.3-0.6 km/s inside the separatrix about 3-8 mm, and it appears on potential, density, electron pressure and Reynolds stress gradients. The dPe/dr fluctuation amplitude can reach 30-40%. The dRs/dr is prior to Er fluctuation about $\pi/2$, indicating the existence of nonlinear interaction between them. In near SOL, this low frequency oscillation also appears in potentials, Er and density fluctuation, suggesting a significant correlation among them at edge and near SOL plasma. This quasi-period oscillation might be correlated with mean flow or low frequency zonal flow, and the latter might set a condition for the former developing, implying a competitive process between them. The competition characterized by a quasi-period oscillation seems to determine the L-H transition.

Country or International Organization of Primary Author

China

Collaboration (if applicable, e.g., International Tokamak Physics Activities)

Xu Min

Primary author: Mr CHENG, Jun (Southwestern Institute of Physics)

Co-authors: Dr LIU, A Di (University of Science and Technology of China); Mr KONG, De Feng (Southwestern Institute of Physics); Prof. DONG, Jia Qi (Southwestern Institute of Physics); Mr CHENG, Jun (China); Prof. ZHAO, Kai Jun (Southwestern Institute of Physics); Dr XU, Min (CMTFO & CER & MAE Department, UCSD); Prof. YANG, Qing Wei (Southwestern Institute of Physics); Dr LAN, Tao (University of Science and Technology of China); Prof. HONG, Wen Yu (Southwestern Institute of Physics); Prof. SONG, Xian Ming (Southwestern Institute of Physics); Prof. DUAN, Xu Ru (Southwestern Institute of Physics); Prof. DING, Xuan Tong (Southwestern Institute of Physics); Mr LI, Yong Gao (Southwestern Institute of Physics); Prof. LIU, Yong (Southwestern Institute of Physics); Mr HUANG, Zhi Hui (Southwestern Institute of Physics)

Presenter: Mr CHENG, Jun (China)

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