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4.56 Measurement of electron temperature fluctuation on the J-TEXT tokamak via correlation ECE

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Anomalous transport is a key issue to affect the confinement properties of plasma. Turbulence measurement is important for the study of anomalous transport. An eight-channel correlation electron cyclotron emission (CECE) system has been developed based on the existing conventional electron cyclotron emission (ECE) radiometer for the measurement of electron temperature fluctuation on the Joint-Texas Experimental (J-TEXT) tokamak. The signal received by the ECE radio frequency (RF) unit is split and fed to the CECE system. Then the signal is resolved by 8 narrow band-pass filters including six YIG filters and two fixed frequency filters. The electron temperature fluctuation at four separate radial positions can be measured by coherences analysis. With an focused lens unit, this system can measure temperature fluctuations which have k_θ≤2.5cmˆ(-1). Based on the CECE system, some interesting phenomena of electron temperature fluctuations have been observed on J-TEXT.

Primary author(s) : YANG, Zhoujun (Huazhong University of Science and Technology)

Co-author(s) : ZHOU, Hao (Huazhong University of Science and Technology); PAN, Xiaoming (Huazhong University of Science and Technology); XIE, Xianli (Huazhong University of Science and Technology); RUAN, Bowen (Huazhong University of Science and Technology)

Presenter(s) : YANG, Zhoujun (Huazhong University of Science and Technology); ZHOU, Hao (Huazhong University of Science and Technology); PAN, Xiaoming (Huazhong University of Science and Technology); XIE, Xianli (Huazhong University of Science and Technology); RUAN, Bowen (Huazhong University of Science and Technology)

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