

Pedestal turbulence experiments on EAST tokamak

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Edge turbulence in pedestal region has been experimentally studied by using a microwave reflectometry on EAST tokamak [1-2]. In lower hybrid wave (LHW) or neutral beam injection (NBI) dominated hating plasma, a coherent mode (CM) was usually observed in the ELM-free phase just after L-H transition. The CM rotated in the electron diamagnetic drift (EDD) direction in the laboratory frame with a poloidal wave number (k_θ) of $0.5 \text{ cm}^{-1} - 0.7 \text{ cm}^{-1}$ and its frequency usually chirped from 80-100 kHz down to 40-50 kHz as pedestal evolves. The appearance of this mode reduced the increasing rate of pedestal pressure, implying that CM may have an effect on outward pedestal transport. This mode can exist about several ten milliseconds and finally replaced by broadband fluctuation in the later ELM-free phase. It was found that the appearance and disappearance of the CM was correlated to the pedestal pressure. In the inter-ELM phase, the pedestal turbulence is generally dominated by broadband (BB) fluctuation with poloidal wave number from 0 to 3 cm^{-1} rotating in the EDD direction in the laboratory frame. Analysis shows that the pedestal pressure increasing rate $dp_{e,ped}/dt$ decreases with amplitude of the broadband fluctuation, implying the BB fluctuation may play an important role in pedestal evolution [3]. The recent observation on the fluctuation just inside the pedestal top is presented in this work.

Keywords: Edge turbulence, coherent mode, broadband fluctuation

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