Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Turbulence driven particle pinch at the pedestal region in EAST[1]

NING YAN, SHENG XU, LIANG CHEN, HENG LAN, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China — Existence of an anomalous inward particle flux in tokamak has been realized for a long time. Since particle transport up the density gradient particularly play a key role on the formation of edge pedestal in H-mode plasma, intensive efforts were made to identify the origin of particle pinch in tokamak. However, the mechanism of particle pinch is still a big challenge for plasma physics. In order to improve our understanding on inward particle pinch, turbulent transport have been investigated in boundary plasma with reciprocating Langmuir probe measurements on EAST. A broad turbulence is detected in pedestal after the L-H transition, which shows as fast (300kHz-500kHz) fluctuations in floating potential signals. It appears and gradually saturates after the dithering phase. The broad turbulence is ultimately terminated by the break out of ELMs. It is observed that most of the particle transport is outward directed before the emergence of broad turbulence. However, the particle transport is reversed to inward direction once the broad turbulence initializes in pedestal. Moreover, the edge pedestal starts to establish at the onset of the observed broad turbulence. It gradually stabilizes with the saturation of broad turbulence. During this period, the fluctuations and associated transport in the SOL are almost unaffected, which suggests a signature of particle pinch induced by the broad turbulence originating at the pedestal region.

[1]Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

Ning Yan
Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

Date submitted: 24 Jul 2015 Electronic form version 1.4