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LVPD Plasma for Studies on ETG Turbulence L.M. AWASTHI, S.K. SINGH, P.K. SRIVASTAVA, U. DHOBI, R. SINGH, S.K. MATTOO, P.K. KAW, Institute for Plasma Research, Bhat, Gandhinagar 382428, India — Role of electron temperature gradient (ETG) in plasma turbulence in tokamaks has been recognized in various experimental and theoretical investigations on plasma transport. However, investigations of ETG turbulence in tokamak devices have been based upon indirect inferences drawn from experimental database. Nor has it been experimentally investigated in basic plasma devices as it is very difficult to produce electron temperature gradient. In this paper, we show that this can be secured by making use of a magnetic electron energy filter. The plasma in Large Volume Plasma Device is characterized by plasma density, $n_{e0} \sim 3 \times 10^{11} \text{ cm}^{-3}$ and $T_{e0} \sim 3 \text{ eV}$. In this device, we have provided a magnetic filter consisting of 155- turns rectangular coil of 4 cm width and varying length of ~ 192 to 15 cm from centre to the edge. The field at the centre of the coil is $\leq 150 \text{ G}$, leaving a residual magnetic field of $\leq 1 \text{ G}$ in the region of experimental investigations. Our results show that ∇T_e in the flat electron density region can be secured by providing radial inhomogeneity in filter magnetic field. Scale length of gradient can be varied from 200 cm to 40 cm in a controlled manner. This has allowed us to undertake detailed investigations on ETG turbulence.

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