The Electron Temperature Gradient (ETG) driven turbulence is considered as a major source of anomalous transport in tokamaks. The experimental investigation of it becomes difficult because of its small-scale nature ($\rho_e \sim \mu m$) at very high magnetic field ($B_T \sim 100$ kG). In pursuit of unfolding characteristic features of ETG turbulence, a high density, $n_e \sim 5 \times 10^{11}$ cm$^{-3}$, low temperature, $T_e \sim 3$eV plasma, suitable for carrying out these studies is produced in Large Volume Plasma Device (LVPD) at an ambient field of $B_z \sim 6$ G. The weak magnetic field makes it possible to measure this instability in LVPD as characteristic scale length of instability becomes, $k_{\perp} \rho_e \sim 1$. Although, it is somewhat easy to produce such plasmas in laboratory but the major problem associated with them is the presence of primary energetic electrons, the very source of producing plasma. The presence of non-Maxwellian electrons corrupts the electron temperature measurements using Langmuir probes.

A large Electron Energy Filter (EEF) is thus installed in LVPD to scavenge the non-thermal component of plasma. The EEF separates the plasma column into the source and the target plasma. The EEF not only controls the gradient in electron temperature but also makes the target plasma free of energetic electrons. It thus produces two distinctly different plasmas, one in which a significant gradient in electron temperature but a flat density is produced ( $\nabla T_e \neq 0, \nabla n = 0$) whereas other has a flat temperature and hollow density( $\nabla T_e = 0, \nabla n > 0$). Our observation provides information on first controlled experiment on ETG turbulence in laboratory plasma. The result exhibits excitation of temperature fluctuations only when $\nabla T_e \neq 0$ and shows complete absence when $\nabla T_e =0$. The observed frequency $\nu = (1$- 80 kHz) lies in the lower hybrid range. The mean wave number, $k_{\perp} = (0.1$- 0.3) cm$^{-1}$ satisfies the condition $k_{\perp} \rho_e \leq 1 \ll k_{\perp} \rho_i$, where $\rho_e$ and $\rho_i$ are the electron and ion Larmor radius respectively. The scaling with plasma beta ($\beta \sim 0.1$- 0.8) shows a good agreement with the theoretical predictions.