Magnetic Electron Drift Wave in SINP Linear Magnetized Plasma Device

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In plasma devices where ions constitute the immobile component providing charge neutralizing background and electrons determining the dynamics, the Electron-MagnetoHydroDynamic (EMHD) model is the more appropriate model to deal with high or intermediate frequency phenomena. Recently in such plasma with inhomogeneous density profile a magnetic electron drift wave has been predicted [Physics of Plasma **11**, 5475 2004]. The wave is similar to the electrostatic drift wave and originates from the inhomogeneity of electron density. The wave propagates perpendicular to both the magnetic field as well as the direction of the direction of the inhomogeneity. The dispersion relation for this wave is: $\omega = k_y \delta_e V_{Ae}/L_n(1 + k_\perp^2 \delta_e^2)$ where V_{Ae} is the electron Alfven velocity, δ_e is the electron skin depth and L_n is the density scalelength. In SINP Linear Magnetized Plasma Device, plasma we are going to perform an experiment where we launch this wave in the azimuthal direction and investigate its characteristics. Plasma of about 8 cm radius will be injected in the device using a 2.45 GHz microwave source in an axial magnetic field environment of $0.1 - 1$ kGauss. The plasma density is estimated to be around 10^{11} to 10^{12} cm-3 giving a frequency 30 MHz and higher. Preliminary results of the experiment will be presented.