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**PULSE FORMING NETWORK- A NOVEL
EXCITATION SYSTEM TO STUDY WHISTLER
DYNAMICS AND MAGNETIC RECONNECTION
PHENOMENON IN LVPD-U**

We discuss the design and performance of a pulse-forming network (PFN)-based pulsed power supply developed for whistler wave excitation in the Large Volume Plasma Device (LVPD-U). The LVPD-U produces a quiescent argon plasma with a typical density of $\sim 3 \times 10^{17} \text{ m}^{-3}$ and an electron temperature of $\sim 4\text{--}5 \text{ eV}$, immersed in an axial magnetic field of 6.2 G. The pulsed power system is based on the discharge of a 50Ω characteristics impedance of PFN on a 50Ω Loop Antenna, capable of storing up to 12 C at a maximum charging voltage of $\leq 20 \text{ kV}$ for $\leq 200\text{A}$ antenna current, through triggered switching of Hydrogen Thyatron. The PFN output is coupled with an electrical galvanic isolation to the loop antenna inside the device through a wide band ferrite-core transformer with inherent impedance matching. A novel current amplitude clipping feature is ensured by playing with BH curve of the ferrite core transformer by raising ferrite core magnetization through a feeble DC biasing loop to the transformer core. The performance of the exciter system is characterized through the excitation of electromagnetic hydrodynamic (EMHD) structures in LVPD plasma and the pulse has been detected by a 3-axis magnet probe. The system provides a controlled and flexible experimental platform for laboratory investigations of whistler wave dynamics, magnetic reconnection, and related space plasma phenomena. Additionally, several experimentally observed features of physical relevance are discussed with results from LVPD experiments.

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