

# **Develop Python based Pulse Configuration Utility for Vertical Field Power Supply operation in SST-1**

## **Abstract**

Institute for Plasma Research (IPR) organization works in the field of Plasma Physics and research associated with it. It holds many research projects on varying topics related to the same. Also, it houses tokamak machines for study of tokamak plasma physics. Steady State Superconducting (SST-1) tokamak machine is one of them. SST-1 Operations division is responsible for carrying out coordinated plasma experiments i.e. configure, synchronize, and operate multiple subsystems (e.g. Power supplies, Heating systems, DAQ systems) from central control. One of the important Power Supplies being Vertical Filed Power Supply (VFPS) which provides equilibrium field for the plasma during complete duration of plasma experiment. This VFPS power supply needs to be preprogrammed with the desired current waveform before carrying out experiment and this is termed as a configuration. The required VFPS current is driven by the physics part but the experiment operator should have provision of manual editing of current waveform. To cater this requirement, a pulse configuration utility is to be designed using Python.

The project involves Python based development of graphical user interface based user interactive utility for configuring a VFPS current waveform. This utility should provide user with different capabilities for example editing waveforms point by point, drawing a new waveform, and overlapping multiple waveforms for comparing with old experiment current waveforms. Additionally, the utility must also carry out validation of current waveforms with defined rules. Validation rules will be based on the power supply ratings and physics requirements. The utility outputs are to be stored in defined templates and formats such as .txt files.

## **Academic Project Requirements:**

**1) Required No. of student(s) for academic project: 1**

**2) Name of course with branch/discipline: B.E./B.Tech. Computer Engineering/IT/MCA**

**3) Academic Project duration:**

**(a) Total academic project duration: 6 Weeks**

**(b) Student's presence at IPR for academic project work: 5 Full working Days per week**

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