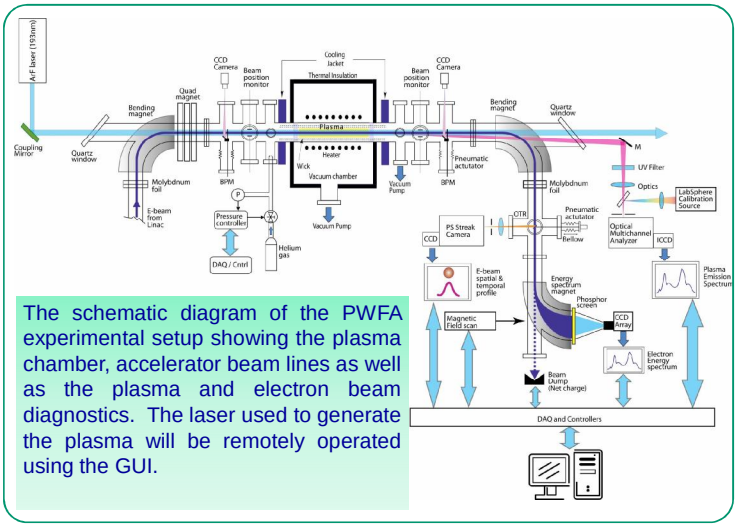
Design & Implementation Of Labview™ Based GUI For Remote Operation And Control Of Excimer Laser For Plasma Wakefield Accelerator Experiment

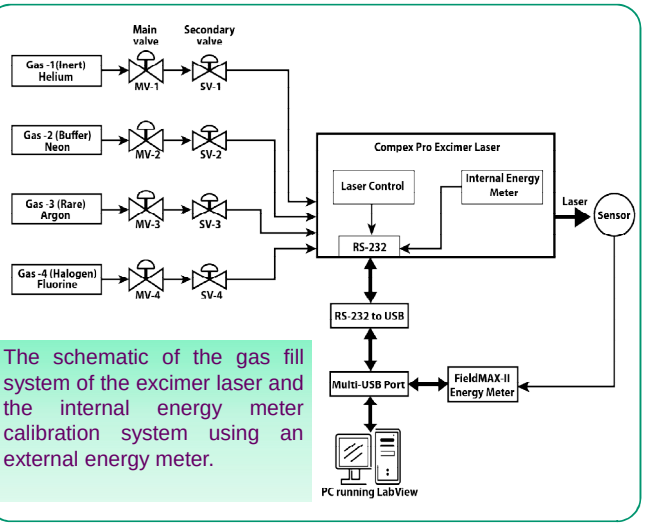
[1]K. K. Mohandas, [1]Kanchan Mahavar, [2]Sandeep Joshi, [2]Ankit Sharma and [1]Ravi A. V. Kumar

[1]Accelerator Division, Institute for Plasma Research, Gandhinagar 382 428, Gujarat (India)
[2]Department of Instrumentation, Nirma University, Ahmedabad 382 481, Gujarat (India)

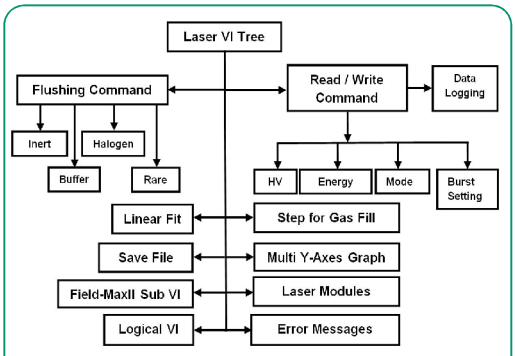
The paper describes the development of a GUI based control software for control/operation, maintenance and data logging of a Coherent CompexPro 102 Excimer Laser (ArF, 193 nm) using LabView™. This control GUI for laser forms part of the Plasma Wakefield Accelerator (PWFA) experiment that is currently being undertaken at the Institute for Plasma Research, Gandhinagar.



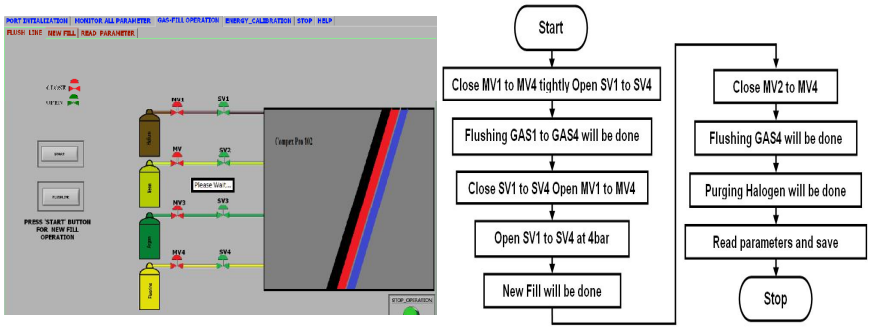
The schematic diagram of the PWFA experimental setup showing the plasma chamber, accelerator beam lines as well as the plasma and electron beam diagnostics. The laser used to generate the plasma will be remotely operated using the GUI.



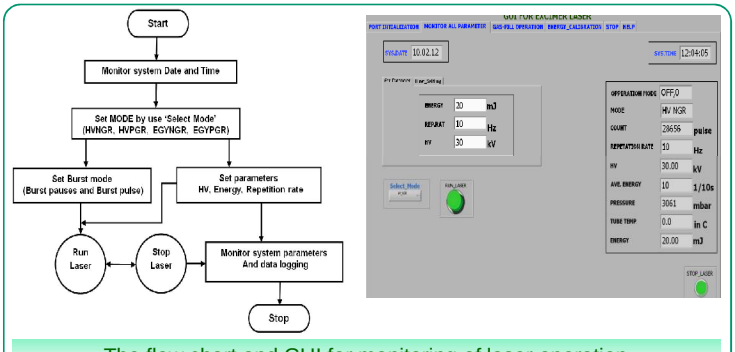
The schematic of the gas fill system of the excimer laser and the internal energy meter calibration system using an external energy meter.



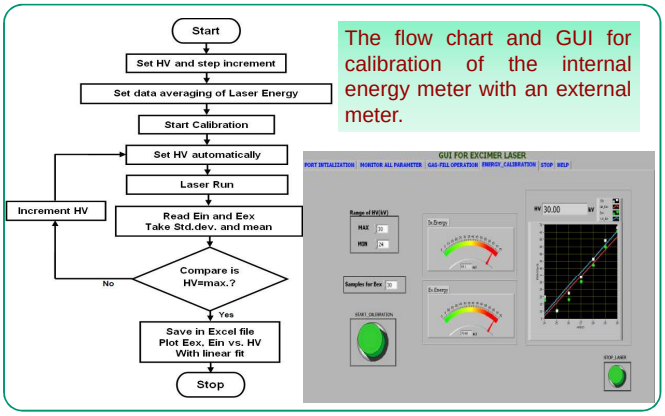
The VI tree showing the various modules used in the GUI for laser control / gas fill / calibration and logging.



The gas-fill process flow chart for the excimer laser system. For a multi-gas system, it is a process that requires manual intervention.



The flow chart and GUI for monitoring of laser operation



The flow chart and GUI for calibration of the internal energy meter with an external meter.

Coherent Compex PRO 102 Excimer Laser	
Wavelength	193 / 248 nm
Pulse width	10-15 ns
Rep. rate	1-20 PPS
Energy	200mJ

Photograph of the PWFA lab showing excimer laser and the plasma chamber system