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Seminar

Institute for Plasma Research

Title : Design and Development of SFP based Prototype Timing System for Steady State Superconducting Tokamak (SST-1)

Speaker: Mr. Jasraj Dhongde
Institute for Plasma Research, Gandhinagar

Date : 16th February 2021 (Tuesday)

Time : 11:00 AM

Venue : Online - Join the talk:

https://meet.ipr.res.in/Open_Presentation_Jasraj

Abstract :

SST-1 timing system is a real time event based trigger generation and distribution system used for the synchronized operation of its various heterogeneous and distributed sub-systems during the plasma discharges. The timing and trigger distribution from central module to sub-systems are to be carried out by a star topology based single mode optical fiber network. A platform independent, stand alone, prototype SFP based timing system is to be designed, developed and tested based on Xilinx's Artix-7 FPGAs for real time event (trigger) distribution amongst different sub-systems of SST-1 over single mode optical fiber network. The new system design's objectives being, to adopt same star topology as the old timing system, to support single mode optical fiber network and to have performance parameters comparable or better than old one.

As stated earlier, prototype timing system is to be designed and developed, with single central timing system module having support to an interface of at-least two (2) (maximum of eight (8)) subsystem modules in star configuration over single optical fiber network. The central timing system module can generate pre-defined experiment event (trigger) sequence in real time with a resolution of 10 μ s and facilitates event logging at a resolution of 1 μ s. Each sub-system module can support eight (8) TTL inputs for asynchronous event generation and eight (8) TTL outputs for trigger pulse generation with a resolution of 1 μ s. Prototype Timing system modules are to be designed using Xilinx's Artix-7 FPGA for the implementation SFP interface and glue-logic for timing, trigger.
