

Measurement System For Channel Electron-Multiplier

Abstract

The Channel Electron Multiplier (CEM) detector mounted in Aditya-U tokamak detects the charge particles or photons. When the incoming particles strikes the surface of the CEM, electrons are ejected. The ejected electrons are accelerated by the applied bias voltage and acquire sufficient energy triggering secondary electron emission from the CEM surface. This process continues through the length of the CEM, striking the surface many times and generating more and more secondary electrons, triggering an output electron avalanche of more than 1×10^7 electrons.

The project involves the development of charge-sensitive pre-amplifier, pulse-shaper and pulse-counting system. A high-voltage biasing will be used for biasing the CEM detector. Also, the system will have an in-built testing point for checking the measurement system electronics without the charge-particle source. LabVIEW based GUI front panel application will be developed for the start and stop of the counting process and for the transfer of detected counts in the host PC through LAN / Serial link.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 2

2) Name of course with branch/discipline: B.E./B.Tech. Electronics and Instrumentation Engineering

3) Academic Project duration:

(a) Total academic project duration: 18 Weeks

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

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