Sample Project: Fast integrated electronics for picosecond timing in high energy physics and medical applications

Code	PH3984
Programme	FCT
Department	PH
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Title

Fast integrated electronics for picosecond timing in high energy physics and medical applications

Description

The research group CERN-PH/DS develops scintillator based sensors suitable for precise time measurements in high energy physic and medical applications like Time-of-Flight Positron in Emission Tomography in the frame an ERC project TICAL (grant number 338933). The timing performance of the detectors is dependent on very high bandwidth and low noise electronics capable to amplify and digitize with high precision the tiny signals produce by the sensors. On the other hand the large number of individual sensors involved in the systems requires the use of large scale electronics integration. In the frame of this research the student will be involved in the evaluation of different electronics techniques to extract the best possible time measurement, including single or multiple threshold discrimination associated to precise Time to Digital Converters (TDC) and waveform sampling at multi Giga samples per second frequency.

The project will be under the cosupervision of E. Auffray, P. Lecoq and J. Varela

Skills

Disciplines

Applied Physics, Electronic Engineering