

'Fast timing' Workshop

Cracow 29-30 , Dec. 1st 2010




Introductory remarks

- History ---> start in 2005 Uchicago/Saclay
- Now regular meetings (once or twice/year)
 - Saclay (march - 2005 & 2007)
 - Lyon (oct 2008)
 - U. Chicago/ANL (march 2009)
 - Clermont Ferrand (Jan 2010)

Purpose & Objectives

- This is a WORKSHOP! NOT A CONFERENCE !
 - Time is flexible --> 30 min per presentation 'in average' ...
 - Room for discussion and exchange of information
- At the origin, this workshop was dedicated to 'Fast electronics and read-out for photodetectors and its applications in various domains with a range of 1 to 10 picoseconds.
- Discuss modern concepts of timing electronics and read-out in 'Real Time' (Trigger and TOF aspects)
- Review on-going efforts and help 'formal/informal' collaborations
- Move to an interdisciplinary world applications
 - HEP, NP, AstroP, Medical imaging and others ...

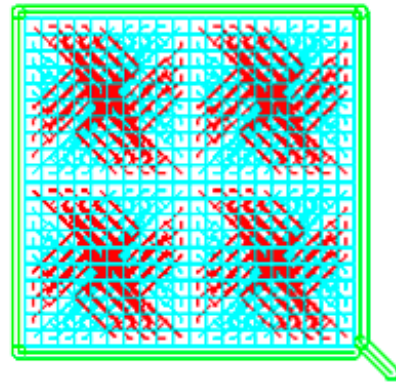
■ All you need to know about picosecond timing is on <http://psec.uchicago.edu/>



PICOSECOND TIMING PROJECT

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A group of us from The University of Chicago, Argonne and Fermilab are interested in the development of large-area systems to measure the time-of-arrival of relativistic particles with (ultimately) 1 pico-second resolution, and for signals typical of Positron-Emission Tomography (PET), a resolution of 30 pico-seconds (sigma on one channel). These are respectively a factor of 100 and 20 better than the present state-of-the-art. This would involve development in a number of intellectually challenging areas: three-dimensional modeling of photo-optical devices, the design and construction of ultra-fast (200 GHz) electronics, the 'end-to-end' (i.e. complete) simulation of large systems, real-time image processing and reconstruction, and the optimization of large detector and analysis systems for medical imaging. In each of these areas there is immense room for creative and innovative thinking, as the underlying technologies have moved faster than the applications. We collectively are an interdisciplinary (High Energy Physics, Radiology, and Electrical Engineering) group working on these problems, and it's interesting and rewarding to cross the knowledge bases of different intellectual disciplines. We welcome inquiries and, even better, help.



Weekly Meeting
Tuesdays at 10am CST
Call: 1-866-740-1260
ID: 2526222#

Mechanicals Meeting
Fridays at 10am CST
Call to join: 510-665-5437
Meeting ID: 7866

Blog Posting Instructions

The workshop topics

■ Photodetectors

- Initially MCP's
 - Development of large MCP's (LAPD project)
 - But it is interesting this time to heard about timing performance of solid state devices like MPPC/SiPM.

■ Electronics , Read out and Trigger

- Fast Digitizers (10-25 psec)
 - Sampling ASIC,TDC ...
- System aspect when large number of pixellated channels

■ Improvment of Time Of Flight (TOF) technique

■ Application in multidiciplinary environment

- HEP , NP and Astro (1 to 50 psec)
 - LHC forward physics, new b Factories,Muons, neutrino,FAIR,
 - future SLHC,ILC/CLIC
- Medical Imaging (50-250 psec)
 - TOF-PET, Real Time PET for Hadrontherapy

Last IEEE NSS-MIC highlights (Knoxville, TN) - Nov 2010

- Progress in scintillators
 - see Paul Lecoq and Marek Moszynski talks
- Photodetectors (3 sessions)
 - a SiPM/MPPC/APD array festival
 - A lot of industrial development
- Electronics
 - Not much compare to the Clermont workshop
- Applications
 - Si-PET & TOF-PET