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TITLE OF THE INVENTION
Sensor characterization servicing

ABSTRACT

A set-up for the characterization of SiPM, in particularly for Photon Detection Efficieny is possible in our laboratory. The wavelength range is between 350-650nm. The method is described in Ref [1].

TECHNOLOGY STAGE

Ready to use.

POSSIBLE APPLICATIONS

Ex.:
• Medical Imaging.
• High-Energy Physics.
• Astronomy/Astrophysics.

INSTRUMENTATIONS

- WaveForm generator AGILENT 3322
- Controlled thermal box ± 0.1 C
- Reference photodetector HAMAMATSU H5783P
- source voltage precise & stable Keithely 6487/E
- fiber connection/FC connectors
- Picosecond laser driver PIcoquant (PLD 800-D)
- Pulsed light source with collimator PLS450
- Pulsed light source with collimator PLS500
- Filters and Optics

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MEASUREMENTS SET-UP

The details of measurement procedure are described in Ref.[1]
In the following only the main guide line are reported, Fig 1.
The light from a Light-Emitting Diode operating in a pulse mode
Was delivered to an optical filter (± 3nm). The filtered light
was routed to a thermostabilized box (± 0.1C). As reference photodetector
a PhotoMultiplier Tube calibrated was used.

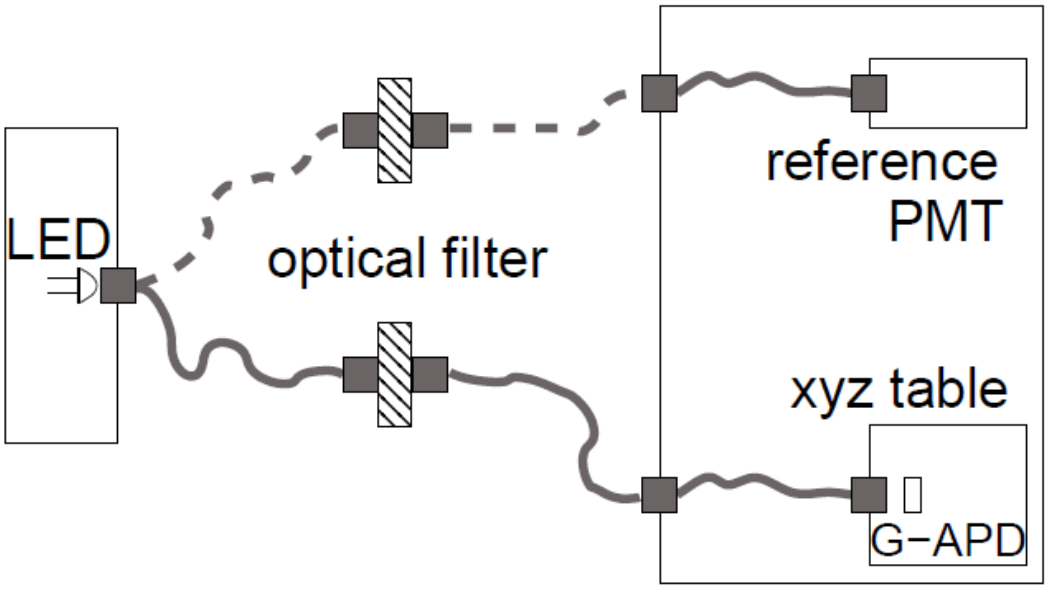


Fig.1 General scheme of PDE measurement

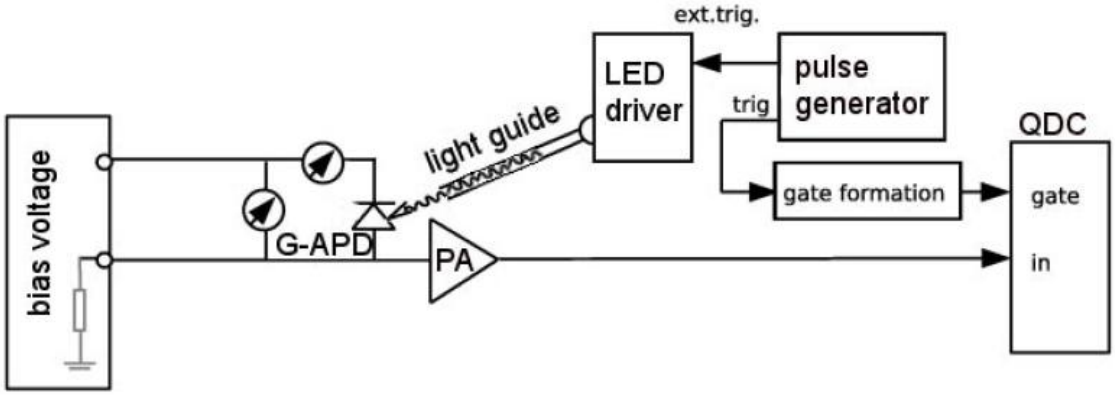
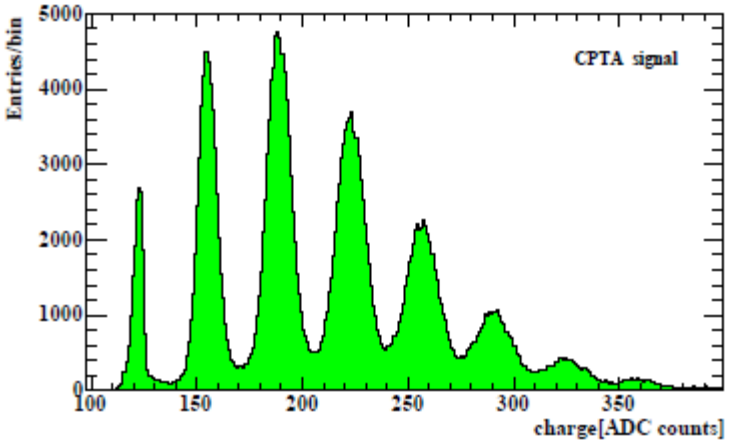


Fig.2 Schematic SIPM readout



Signal spectra obtained with CPTA detector by short, low intensity LED at $\lambda = 600 \pm 3$nm. Each peak corresponds to a number of detected photons.

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EXISTING APPLICATIONS

- Astroparticles.
- Astrophotometry
- High Energy Physics: Calorimeters
- Medical immaging

ADVANTAGES

• The set-up provides characteristics of SIPM of different firms in same condition without any complex instrumentation. The data analysis procedure is a new method implemented from authors.

LIMITATIONS

• The servicing in the present set-up is limited to the wave length ranges mentioned forhead

REFERENCES

1)Measurements of photon detection efficiency of Geiger-mode avalanche photodiodes (G-APD) S Gentile, F.Meddi, E. Kuznetsova. , Il Nuovo Cimento B 125,08,(2010)

2)Photon detection efficiency of Geiger-mode avalanche photodiodes S Gentile, F.Meddi, E. Kuznetsova. ,
Proceeding International Linera Collider Workshop 2010, LCWS10 and ILC10, March 26-30, 2010, IHEP, China (arXiv::1006.3263).

3)Measurements of the photon detection efficiency done for Geiger-mode avalanche photodiodes(G-APD) S Gentile,F.Meddi,E. Kuznetsova (Oct. 2009) , Proceeding 11th ICATPP Conference, 5 - 9 October 2009,Villa Olmo,Como,Italy (published from World Scientific Publishing).

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