Introduction

Large Scale Characterization section.

Nowadays Silicon Photomultipliers are being widely introduced to many HEP experiments and applications. In some experiments and systems such as: T2K, Dark side, COMPASS, NICA-MPD, Mu2e, SciTIL for PANDA, GlueX, DANSS, MEG, nEXO, AMADEUS, CALICE, CMS, AD, sPhenix, Astroparticle experiments, PET-tomography and many other hundreds and thousands of SiPMs were used or planned to be used. To apply such an amount of SiPM we need to calibrate and learn their characteristics and performance parameters of each photosensor as: PDE, Gain, Dark rate and other. There are many ways to do this: by extracting parameters from IV-curves, from low intensity light spectra, from dark rate spectra and other techniques. Some of these approaches could be applied for all pieces, some require just sampling tests. Some methods can provide user with better and wider knowledge of the parameters, some methods just indicate to the parameters. Some parameters like spectral sensitivity or temperature behavior can characterize whole family of photosensors and there is no need to test each of SiPMs individually. Photosensors could be tested on a wafer before casing or as end-product or even in the detector environment. In this Topical Group we would like to share experience in modern techniques of mass-testing and characterization of SiPMs, learn more about compromises of different approaches between mass-testing and sampling tests and end up with performance of tested SiPM in the real detector or system.