Contribution ID: **6** Type: **not specified**

Silicon Photosensors in Ring Imaging Cherenkov detectors

Tuesday 16 May 2023 09:30 (25 minutes)

Ring Imaging Cherenkov detectors are moving towards new photodetection technologies for exploring more accurate timing and amplitude resolutions. Silicon photomultipliers (SiPMS) can play such a role, played by photomultiplier tubes until now. SiPMs measure single photon signals with time resolutions up to picoseconds. Their photodetection efficiency surpasses the photomultiplier tubes, reaching up to 50% (in Near Ultra-Violet SiPMs, 60%). The SiPM's fill factor was a problem in the early times of SiPMs, but it has enhanced to 90% nowadays. The main SiPM drawbacks are temperature dependency and high dark count rates. We are investigating methodologies for temperature effect compensation in SiPMs and new trigger systems for readout electronics.

Requested length

20 minutes

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Session Classification: Session 1