

SensL New Fast Timing SPM - High-Speed Silicon Photomultiplier Signal Output for High-Performance Timing Applications

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In this paper we report on a new silicon photomultiplier (SPM) architecture with additional signal output for a timing measurement. This additional output has very fast single photo electron response (about 2 ns FWTM). This new device can be easily integrated into legacy systems by providing the ability to operate as a normal SPM with Anode readout or in new designs with an additional fast output. As result the rise time of timing signal for LYSO scintillator coupled to this new fast SPM is about 2ns, compared with typical 20-40ns for SPM's anode signal. This enables unprecedented coincidence-timing performance improvements for SPM devices, from 570 ps (Coincidence Resolved Time FWHM) to better than 380ps (CRT FWHM) coincidence timing resolution for SM series devices.

Primary author: Dr KEVIN, O'Neill (SensL Technologies Ltd)

Co-authors: Dr JACKSON, Carl (SensL Technologies Ltd); Mr NIKOLAI, Pavlov (SensL Technologies Ltd); Dr DOLINSKY, Sergei (GE Global Research, Niskayuna, NY, USA)

Presenter: Dr KEVIN, O'Neill (SensL Technologies Ltd)

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