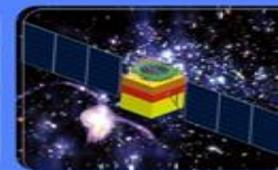


Study on the Timing Performance of the SiPM

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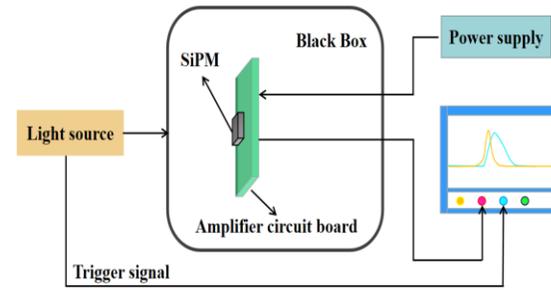
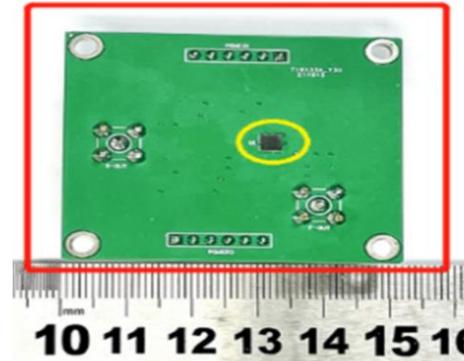
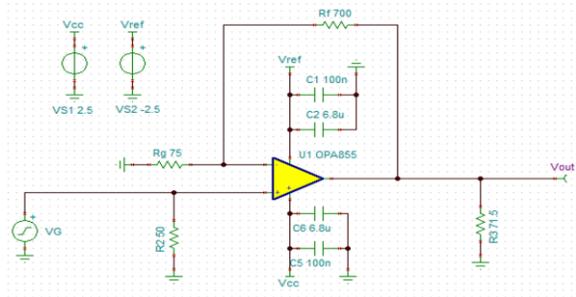
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The Institute of High Energy Physics, CAS

Study on the Timing Performance of the SiPM



Parameters	SensL J-30035	NDL 11-3030C-S	Hamamatsu S13360-1325CS
Optimized Voltage (V)	28.5	41.0	58.0
Rise Time (ns)	0.5	1.5	1.5
Time Resolution Limit (ps)	22.2	21.8	193.6

Simulation

Validation

Measurement

Result

◆ A fast-timing amplifier circuit based on operational amplifier OPA855 was simulated to realized single photoelectron calibration and excellent time resolution at the same time

◆ The fast-timing amplifier circuit based on the simulation design has been implemented and tested, which features a gain > 10 , noise ~ 0.8 mV and power ~ 40 mW

◆ The timing performance of three different types of SiPMs have been measured based on this fast-timing amplifier and high-performance oscilloscope

◆ Excellent time resolution of ~ 20 ps can be obtained for NDL and SensL SiPMs, and the rise time can be as good as 0.5 ns for SensL SiPMs, having great potential in timing measurement