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Simulation of Silicon Photomultipliers

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In this talk a generic framework for the simulation of the response of Silicon Photomultipliers (SiPMs) is presented. The framework allows a custom definition of the SiPM parameters and geometry and provides a detailed model of the SiPM response. The simulation generates the signal charge and pulse shape for arbitrary incident light pulse distributions and the specified SiPM properties which can be determined from basic characterisation measurements. The simulation has been validated in the full dynamic range for a Hamamatsu MPPC with 100 pixels and was used to study the effect of optical cross-talk and after-pulsing on the response curve and the photon-counting resolution.

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