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Timing Properties Discussion & Summary

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The rapidly growing use of silicon photomultipliers (SiPMs) makes it necessary to standardize the various parameters related to this device with the final goal of rendering measurements comparable within different research groups and the industry. This summary talk will focus on the intrinsic timing parameters of SiPMs, i.e. the single photon time resolution (SPTR).

We will present our reasoned definition of the SPTR for the analog and digital SiPM with an explanation and justification of the corresponding terms via detailed physical models. The link to applications, e.g. time of flight positron emission tomography, will additionally rationalize our approach. After discussing the main definitions we will show how a typical measurement setup can be conceived and consider in detail all components and parameters of the setup for a reliable and comparable SPTR measurement. A further focus will be given on the intrinsic difference of analog and digital SiPM with the goal of establishing a common platform for comparing both types of photodetectors in terms of their timing performance.

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