

## Recent development of MPPC and Si detectors for HEP experiments

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Nearly 10 years have passed since Hamamatsu started developing the MPPC, which is a part of the SiPM family. The most important feature is its photon counting capability due to its high gain and low noise, but the MPPC has many additional features such as compact size, low operation voltage, robustness, high detection efficiency, and immunity to magnetic fields. Over the years, various types of MPPC technology and devices have been developed for specific applications such as academic research, medical, precise measurement, and industrial. Recent developments resulted in covering different wavelength regions such as VUV, VIS, and NIR, to make the MPPC suitable for a wider field of applications. Recently, the demand for NIR-enhanced MPPCs became very popular in distance measurement applications in the automotive industry. In addition to developing the detector, Hamamatsu also developed ASIC, power supplies, and modules using these components to make it easy for customers to design their systems.

Hamamatsu SSD(Silicon Strip Detectors) and PAD(Pixel Array detectors) have been used in many collider experiments (ATLAS, CMS, Belle, etc.). Now we are developing larger PAD with 8inches wafer for HL-LHC. In this presentation, we will discuss new MPPCs and various techniques to control MPPCs. And we will talk about new silicon detectors developing for HEP experiments.

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