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Development of a UV-transparent Lens Array Enlarging the Effective Area of Multi-channel SiPMs

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Recent progress of the SiPM technologies, such as high photon detection efficiency (PDE) and well-suppressed optical crosstalk have made it possible to replace conventional photomultiplier tubes (PMTs) with SiPMs in many applications. However SiPM prices per unit area is still higher than those of PMTs, and thus production of a large SiPM array is not cost effective yet. We have developed a UV-transparent lens array for multi-channel SiPMs, with which incident photons can be concentrated onto a smaller region of the SiPM surface, resulting in a larger effective area with the same SiPM size. We report a ray-tracing simulation and measurement result of the lens array performance.

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