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## **New improvements to a specialized Multi-Pixel Photon Counter (MPPC) for neutrinoless double-beta decay and dark matter search experiments**

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Hamamatsu Photonics K. K., a major manufacturer of a wide variety of silicon photodetectors including the Multi-Pixel Photon Counter (MPPC), has developed MPPCs that are capable of detecting light down to 120 nm, covering scintillation wavelengths of liquid xenon and argon. Following the development efforts that we outlined in our presentation at TAUP 2015, we will provide an update on the results of those efforts, including enhancement of our cryogenically-compatible ultralow-RI packaging options. Furthermore, we will introduce a 4th generation of our specialized MPPC for cryogenic physics experiments. In addition to diminished after-pulsing and inter-pixel trenches to suppress optical cross-talk, we've achieved increased VUV photosensitivity in this new MPPC through new modifications of the device structure. By achieving these results and continuing our MPPC improvements, including the ongoing development of a novel anti-reflection layer for incident VUV light, we hope to make a valuable contribution to the physics community's efforts towards discovery of dark matter and the neutrinoless double-beta decay.

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