

Performance of the latest prototypes of NUV-HD Silicon Photomultipliers

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In this work, we will present the latest Silicon photomultiplier technology (SiPM), developed in Fondazione Bruno Kessler, designed to detect UV and blue light and named NUV-HD.

With respect to the original NUV technology, shown at last VCI, the High-Density (HD) one has the same electrical field profile but a novel layout with a lower dead border area and the introduction of trenches between cells. This new layout allows having a lower cell pitch, ranging from 15 to 40 μm , reducing the gain of the cell and the correlated noise probabilities, increasing the dynamic range and the fill factor, from 55% to 80% in bigger cells.

Considering the PDE, the new technology shows a peak centered in 400-420 nm as its predecessor, but reaches an impressive value of about 60% for the 40 μm cell. This technology reaches the highest PDE value compared to state-of-the-art commercial SiPMs.

We will show a complete characterization focusing on the most relevant parameters of a SiPM (PDE, DCR, Correlated Noise probabilities, etc.) and comparing these values to the non-HD technology.

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