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First results on NUV-SiPMs at FBK

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In this contribution we show selected results on the first release of UV-enhanced SiPM technology (NUV-SiPM) produced at FBK. In particular, we focus our attention on the photo-detection efficiency (PDE) performance. The PDE in the near-UV part of the light spectrum is mainly limited by the quantum efficiency term since the photo-generation takes place in a very shallow region of the silicon. Thus, besides using a p^+ -on-n junction configuration to have an avalanche triggered by the electrons, we need to implement a very shallow p^+ layer.

In this context, we will show that our NUV-SiPM technology features a quantum efficiency higher than 80% in the measured range between 360 nm and 420 nm. This allows to reach a PDE of 30% at 9 V over-voltage with a device featuring $50 \times 50 \mu\text{m}^2$ cell size and 45% fill factor. We will also show other important features of the device such as breakdown voltage temperature dependence, single-cell response uniformity and noise.

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