

Status and perspectives of SiPMs at FBK

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Thanks to the continuous improvement of their performance, SiPMs are now considered for the upgrades of several, big physics experiments, ranging from High-energy Physics to rare events physics, to astroparticle physics. However, considering that the incremental improvements between subsequent generations of SiPMs are reaching saturation, a deeper redesign of the photon detector as a whole, including photosensor and readout electronics, is needed. FBK is working on the development of the next-generation of SiPMs, with a strong focus on 3D integration, such as SiPMs featuring medium-to-fine-pitch Through Silicon Vias (TSVs) and Backside-illuminated (BSI) devices. A fine segmentation of the sensitive area in separated mini-SiPMs will reduce output capacitance and optimize signal integrity and timing. BSI-SiPMs will potentially bring additional advantages, such as a PDE close to 100%, enhanced radiation hardness, single-cell connection to the readout electronics and a uniform light entrance window, suitable for the most advanced optical stacks.

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20 minutes

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