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Research of the Silicon Photomultipliers for various applications

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In these last few years, Silicon Photomultipliers (SiPMs) have become a very popular in the detector research community because of their promising new features.

These novel photo-detectors promise to deliver high quantum efficiency, wide spectral range, low noise coupled to high gains (105-106), and very fast time response. Our group is currently evaluating and designing new devices for applications ranging from high energy physics and astroparticle physics, to earth imaging, and gas and plasma spectroscopy.

Here we will present device signal and current characterizations performed at various temperatures and at different photon wavelengths. We have used fast laser pulsing to ascertain the temporal properties of the devices. A comparison is also made between current commercial devices and custom built ones delivered by FBK-IRST.

As a last item, new front-end amplifier developments and their application to some of the above mentioned fields will also be discussed.

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