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SiPM thermoregulated fast front end electronics for Time Of Flight detectors in space

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Silicon Photomultiplier (SiPM) are considered very promising in many applications where high timing performance, low cost, hardness to radiation damage and single photon counting are requested. Such applications go from astrophysics, high energy accelerator physics and medical physics. A group of SiPM from FBK-Irst has been tested with a low noise fast amplifier, based on a hetero-junction FET, mounted on a proper front end board. A first cosmic ray telescope prototype has been used to test the electronics and results are shown. The SiPM gain depends critically on temperature and the use of a thermoelectric module to control the circuit was also studied in order to use the system for space detectors.

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