Development of 3D detectors and SiPM at ITC-irst

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In this talk we present some selected results from the new activities undertaken in the framework of a collaboration between INFN and ITC-irst and focused on the development of MEMS. In particular we will report on: i) 3D silicon detectors and ii) Silicon PhotoMultipliers (SiPM).

i) 3D detectors, characterized by low depletion voltage and fast collection times, are very promising attractive for a variety of applications, including tracking of high-energy particles and X-ray imaging. We have proposed a new 3D architecture which features columnar electrodes of the same doping type allowing a considerable simplification of the manufacturing process. In this work we present some selected results from electrical characterization of both detectors and diodes fabricated at ITC-irst with this technology.
ii) The SiPM consists of an array of avalanche diodes connected in parallel as to form a single read-out element. Each pixel is made by an APD device working in Geiger mode in series with a quenching resistance. The electrical characterization of first detectors produced by ITC-irst will be presented. Preliminary optical test will be presented as well.