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## Development of a TOF PET Prostate Probe Readout System

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A compact readout system for a matrix of Silicon PhotoMultipliers (SiPM) has been developed in the framework of the TOPEM (TOF PET MRI) INFN research program.

The electronic system was designed to completely handle 128 pixels (a SiPM matrix), independently measuring both the arrival time of the incoming photons and the charge of the detected signal.

The design is based on existing ASICs, developed in the framework of high energy physics, achieving a good compromise in compactness, speed and power.

The controller of this system is interfaced to a Linux based PC running the data acquisition and event display code. The communication between the PC and our system is done using the USB 2.0 protocol, which can run up to 25 MB/s.

Moreover in the controller can be realized a coincidence logic with an external detector, thus permitting to trigger the data acquisition, implementing a complete TOF-PET system.

In parallel to this work a dedicated ASIC is under advanced development, implementing all the needed functions and giving a higher compactness, necessary to build a real detector to be used in clinical practice. A prototype with the basic building blocks has been developed and an evolved version is under design.

We report here the design of the system and some laboratory measurements.

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