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HIPeR: High channel Integration Picosecond Readout - An integrated readout solution for Large Area Picosecond Photo Detectors

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The transit time spread timing performance reported for Large Area Picosecond Photo Detector (LAPPD™) is often limited by the speed of cost-effective readout electronics, rather than the actual timing of the detector device itself. In this paper, an electronic board is presented that integrates a high-speed low-cost waveform sampling ASIC directly onto readout boards that can be located at the detector, or, in the case of LAPPD, coupled directly to the bottom of the detector, able to acquire time synchronized waveform data locally and promptly export a reduced data set, including charge, position and accurate timing information. The readout AARDVARC waveform digitizing chip with a sample rate of up to 14 GSa/s and a timing resolution below 5 ps is used as a scalable building block.
We describe the HIPeR board and the first measurements while coupled with a LAPPD™, its performance, as well as the advantages in terms of flexibility of acquisition modes (triggered, streaming).

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

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