



Contribution ID: 456

Type: Oral

## The Timepix3 readout chip: design, tests and first measurements with silicon sensors

*Friday 6 June 2014 12:20 (20 minutes)*

Timepix3 is a unique ASIC developed to provide fast readout in a low to medium hit rate environment. The pixel matrix consists of 256x256 pixels with a pitch of 55 $\mu$ m. The chip can be configured in either data driven or frame-based modes. In data driven mode the chip sends out a 48-bit package every time a pixel is hit while the shutter is open. This packet contains 18bits of Time-Of-Arrival and 10bits of Time-Over-Threshold (TOT). In data driven mode the chip can cope with a hit rate up to 40MHits/s/cm<sup>2</sup>. The finest arrival time resolution is 1.56ns. The chip can also be used in a frame-based mode providing either the same hit information as in the data driven mode or simultaneous event counting and integral TOT information per pixel.

Recently, the first Timepix3 chips bump bonded to a 300 $\mu$ m thick Silicon sensor became available. In this talk the chip and its most important design features will be introduced. Test results of the stand-alone chip will be shown, together with the first measurements obtained using assemblies with sensor.

**Primary author:** DE GASPARI, Massimiliano (CERN)

**Co-authors:** Dr KRUTH, Andre Konrad (University of Bonn); BREZINA, Christoph (University Bonn); ZAP-PON, Francesco (Nikhef); DESCH, Klaus (University of Bonn); VAN BEUZEKOM, Martin (NIKHEF (NL)); CAMP-BELL, Michael (CERN); Mr KLUIT, Ruud (Nikhef (NL)); POIKELA, Tuomas Sakari (University of Turku (FI)); GRO-MOV, Vladimir (NIKHEF (NL)); ZIVKOVIC, Vladimir (NIKHEF Institute); LLOPART CUDIE, Xavi (CERN); FU, Yunan

**Presenter:** DE GASPARI, Massimiliano (CERN)

**Session Classification:** III.a FE & ASICs

**Track Classification:** Data-processing: 3a) Front-end Electronics