



Contribution ID: 16

Type: **not specified**

# The TimePix3 Telescope

*Wednesday, 3 February 2016 09:10 (20 minutes)*

The TimePix3 telescope is a high rate, data driven beam telescope being used to study sensor prototypes for the LHCb VERTex LOcator (VELO) upgrade. In addition to VELO prototype sensors, the telescope has been used to study Upstream Tracker (UT), Scintillating Fibre (SciFi), Ring Imaging CHerenkov (RICH), Time-Of-Flight Ring Imaging CHerenkov (TORCH) and Gridpix prototypes. The telescope consists of 8 layers of 300 um p-on-n silicon sensors read out by TimePix3 ASICs. Tracks measured with the telescope have excellent temporal ( $\sim 1$  ns) and spatial resolution ( $\sim 2$  um), and can operate at a rate of up to 10 Mtrack/s. Besides the telescope performance we also present the software framework used in the reconstruction and analysis of the telescope data. This is based on the Gaudi framework used by many HEP experiments including LHCb. The software can reconstruct and analyze  $\sim 15,000$  tracks per second. Alignment and reconstruction are performed automatically on a distributed computing system. The framework allows for flexible integration of detectors from external users via time-stamped triggers. During the 2015 testbeam campaigns, approximately 37 billion tracks were recorded and reconstructed.

**Primary author:** Mr EVANS, Timothy (CERN)

**Presenter:** Mr EVANS, Timothy (CERN)

**Session Classification:** Beam telescopes