



Contribution ID: 20

Type: **not specified**

# High rate pixel telescope.

*Wednesday 3 February 2016 14:20 (20 minutes)*

We present the design, the commissioning, and the performance of a modular pixel telescope, which was equipped with the CMS PSI46v2 pixel chip. The telescope was designed with a primary goal of testing pad and pixel diamond detectors in the high flux beam line at the High Intensity Proton Accelerator in PSI. This beam line is able to provide intensities up to 10 MHz/cm<sup>2</sup>. The unique features of the PSI46v2 chip are its ability to provide a fast trigger and its ability to scale down the trigger area to the size of the device under test (DUT). The main module of the telescope is based on the motherboard, which accepts up to 3 pixel planes. Several motherboards can be combined into a single telescope read out by a single test board. In the beam test the telescope was used in a configuration with two front and two back planes, where the DUT was placed in between the front and the back modules. The same motherboard can be used to accommodate other versions of the PSI46 chip, for example, the low threshold PSI46dig chip, which was used as DUT. The low threshold of the PSI46dig chip makes it suitable for studying sensors with low signals. In another configuration the telescope was used to test two diamond pad detectors. The telescope DAQ is based on the EUDAQ framework, with a specially added feature to monitor both the performance of the telescope and of the DUTs.

**Primary authors:** Dr HITS, Dmitry (ETHZ); Mr BACHMAIR, Felix (ETHZ); Mr REICHMANN, Michael (ETHZ)

**Presenter:** Mr REICHMANN, Michael (ETHZ)

**Session Classification:** Beam telescopes