

A EUDET/AIDA high-resolution pixel telescope as tool for testing tracking detectors

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In this talk I present our experience with the development of a high-resolution pixel beam telescope within EU FP projects EUDET (2006-2010) and AIDA (2011-2015) as common infrastructure for tracking detector beam tests.

A beam telescope is a tool to define the exact track of a particle in a test beam with highest possible precision and is used for performance studies of tracking detectors and for benchmarking new technologies. The pointing resolution of the telescope is required to exceed the expected intrinsic resolution of the device under test. The EUDET telescope consists of six MAPS planes (Mimosa26) with a pixel pitch of 18.4 μm and thinned down to 50 μm . The first version of the sensors readout based on VME bus is briefly discussed and the new system based on National Instruments PXI express bus is presented. The excellent resolution, readout rate and DAQ integration capabilities made the telescope a primary test beam tool for many groups including several CERN based experiments.

Within the new European detector infrastructure project EU FP7 AIDA the test beam telescope is being extended in terms of cooling infrastructure, common HV and LV powering, asynchronous triggering of the readout systems, beam profile acceptance. In order to provide a system generic enough to suit requirements from both the LHC and future Linear Collider R&D groups a combination of various pixel technologies is foreseen. In this talk two LHC type technologies (TimePix, ATLAS FE-I4) and their benefits will be discussed.