CERN CLIC Vertex test beam August 2014

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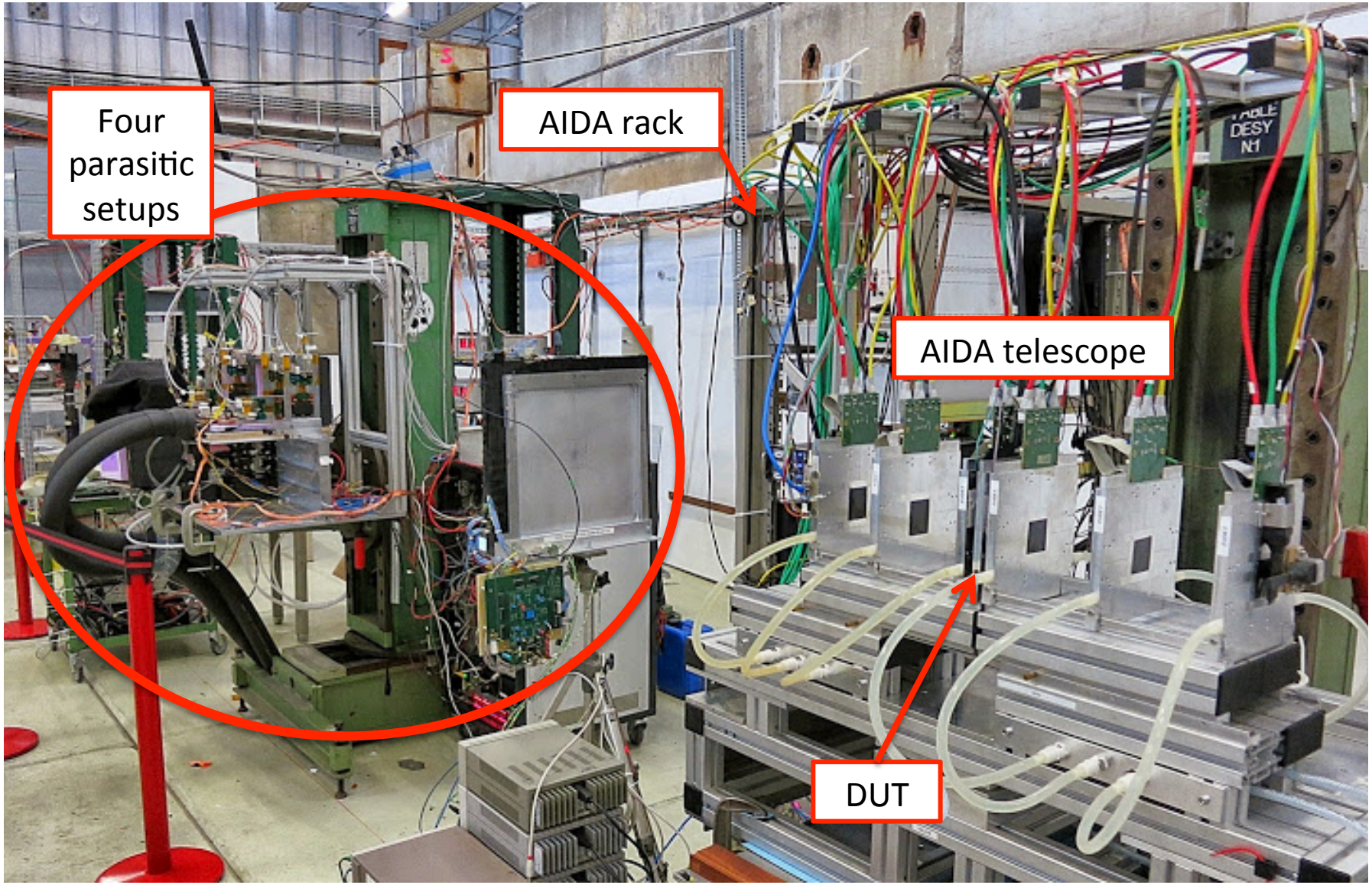
Introduction

- Main goal of this testbeam period:
  - Integrate Timepix3 and CLICpix readouts with AIDA telescope for future data taking at CERN
  - Record data with Timepix3
    - Bias scan, threshold scans
  - Record basic data with CLICpix (no energy measurement)

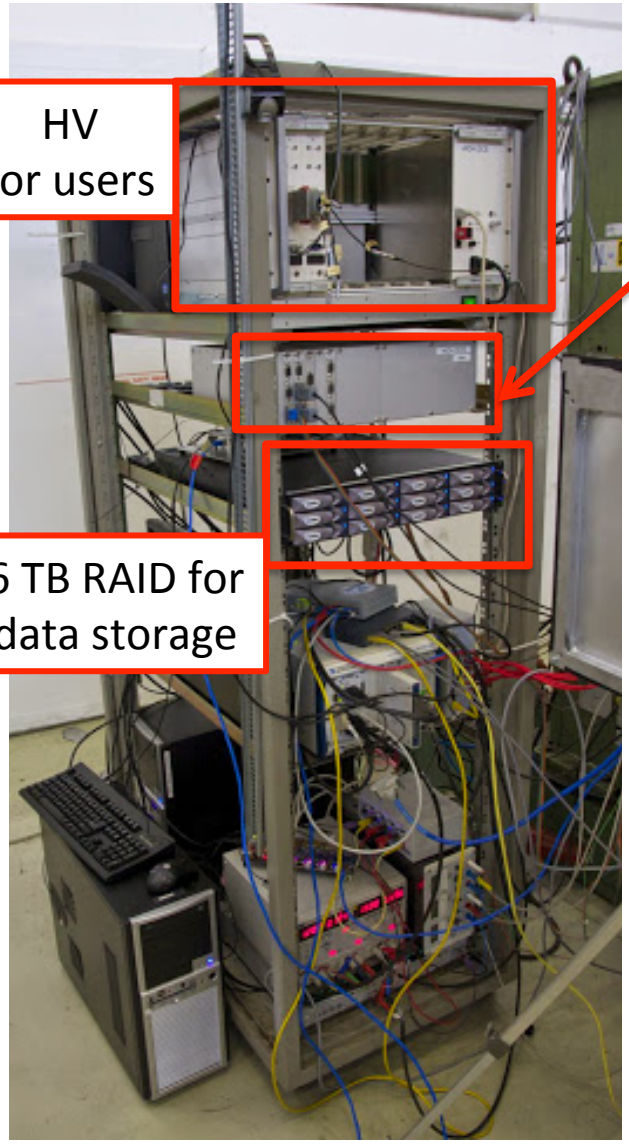
- Additionally
  - Take data with 300um Timepix1 assemblies for 2013 data completion
    - Bias scan and threshold scan
  - MiniTLU high rate asynchronous trigger system commissioning to prepare migration to EUDAQ v2

- Data taking period
  - 14 days: 14/08 --> 28/08
  - Very smooth coordination with parasitic users

Setup in T9 area

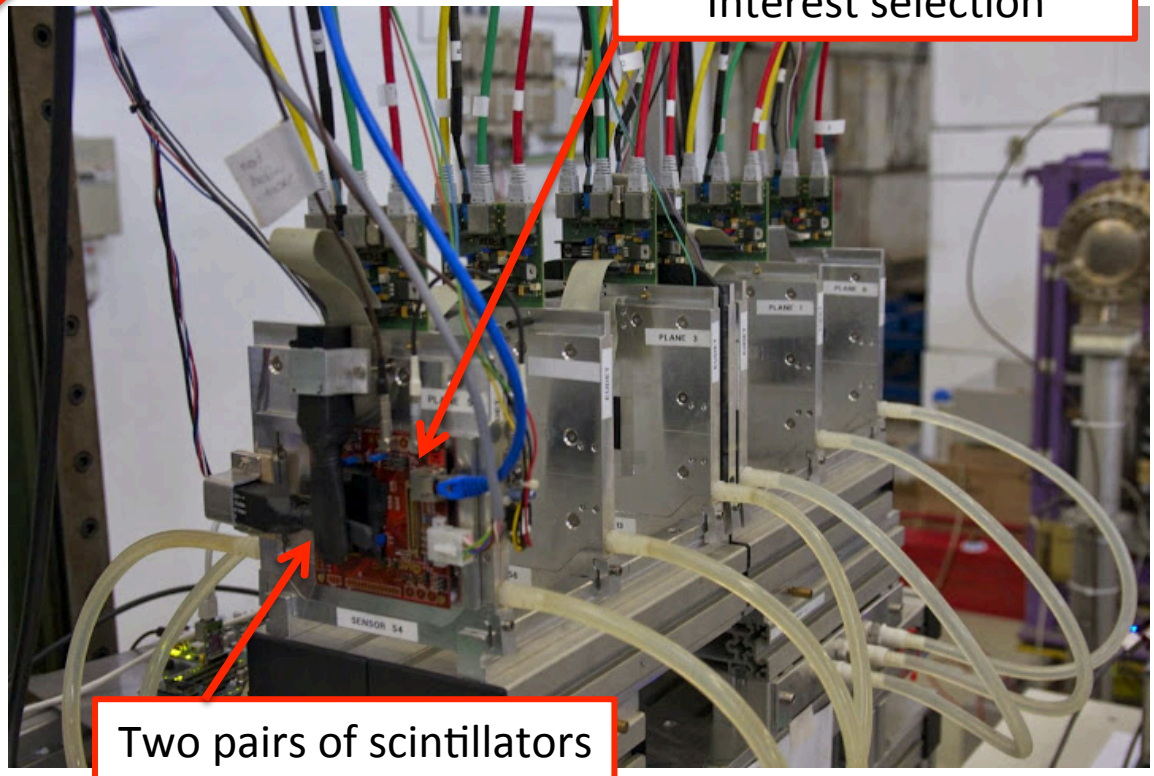


AIDA infrastructure



Temperature/Humidity monitoring

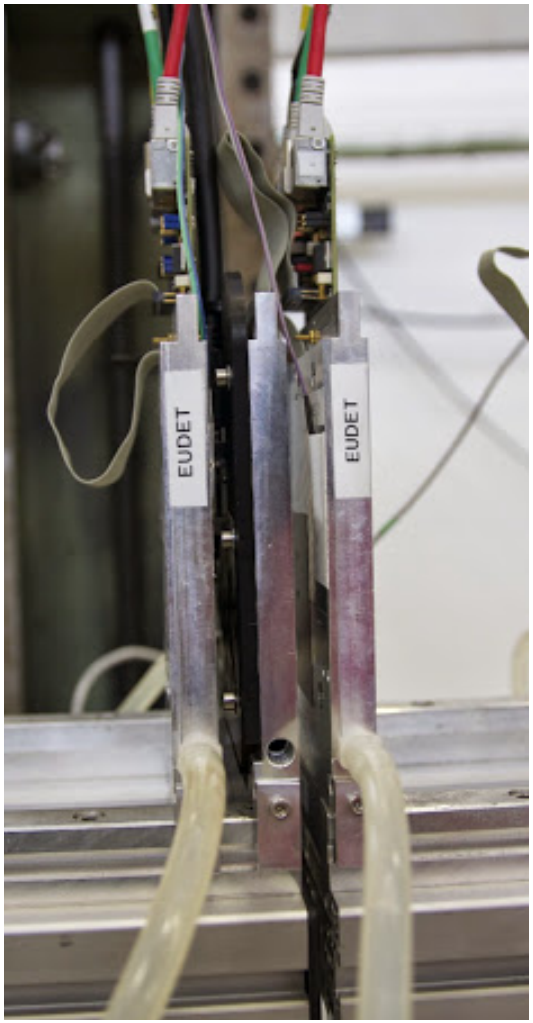
ATLAS FEI4 plane for timing and Region-Of-Interest selection



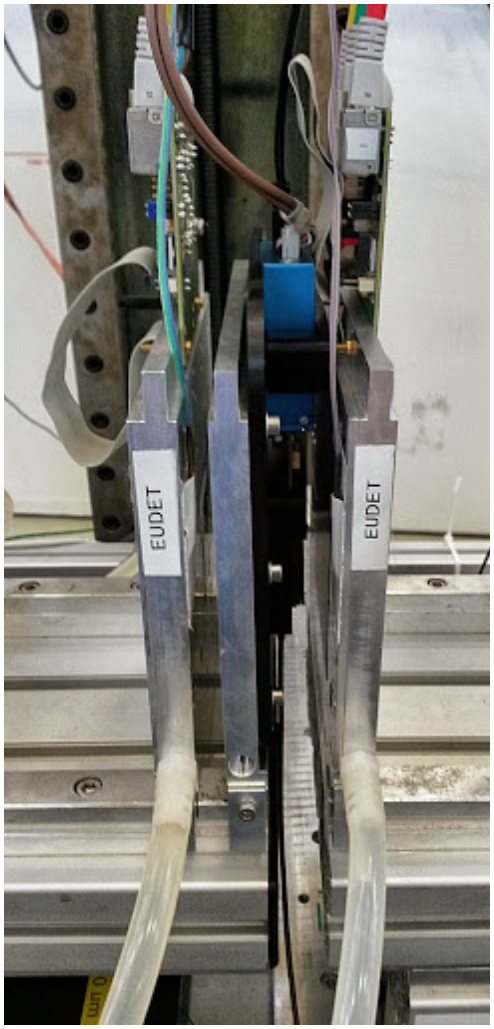
Two pairs of scintillators for trigger

DUT integration

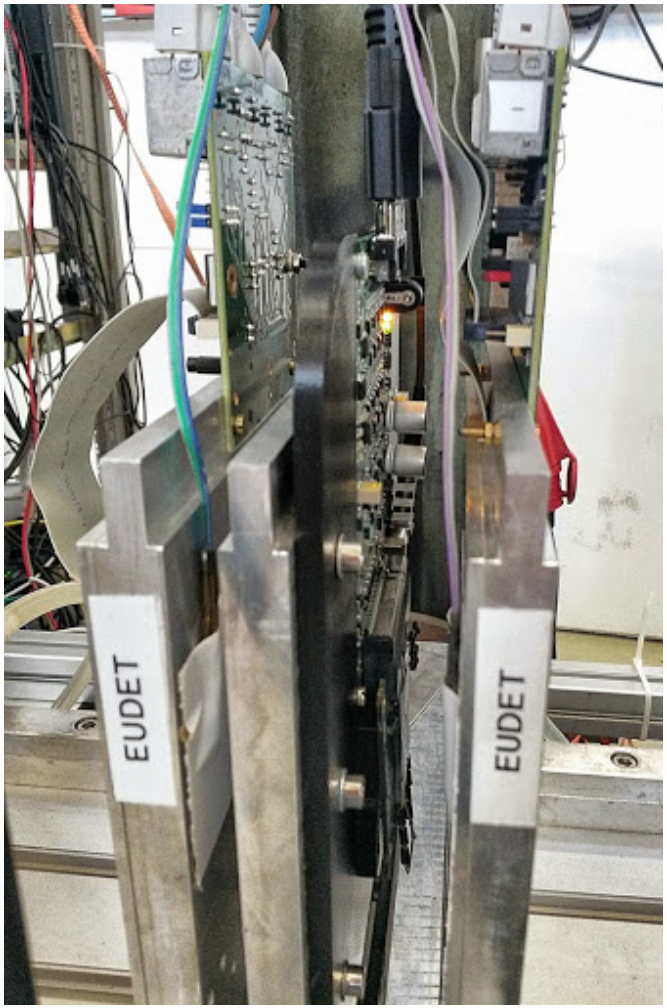
Timepix3



Timepix1



CLICpix



Beam conditions

- 10 GeV beam (positive polarity)

- Rate:
  - ~150k particles/spill (beam scint.)
  - Through the telescope acceptance (trigger scintillators): ~20k particles/spill

- Beam focusing
  - We mostly used parallel beam settings: better for track reconstruction in the telescope

Data taken

	Run types	Total #tracks
Timepix3 W2_H5	Vbias scan Threshold scan	569M
Timepix3 W2_J5	Vbias scan Threshold scan	318M
CLICpix	Nominal bias, photon counting mode (no ToT)	6.9M (of which ~1% contains CLICpix hits because of its size)
Timepix1 (300um assembly)	Vbias scan Threshold scan	13M
Telescope only	Rate tests	19M

Summary

- Overall very successful data taking period
  - Thanks to everyone invloved!

- More information
  - https://twiki.cern.ch/twiki/bin/view/MimosaTelescope/WebHome
  - http://clicdp.web.cern.ch/content/wg-clic-vertex-detector-technology