

TRT test beam at COSY 2023 plans

Oleg Kiselev

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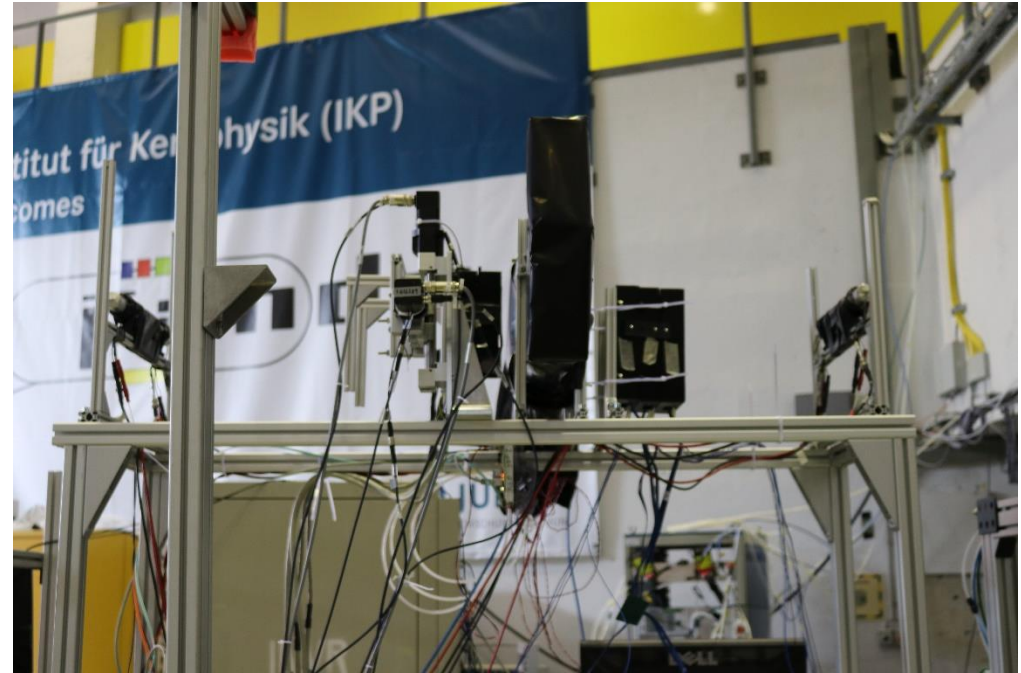
Setup at COSY in July 2023

- Running time – July 17 -23, full time
- Energy 1 GeV, 240 MeV, 100 MeV
- 6 x single ALPIDE detectors, readout by MOSAIC modules
- 2 x FOOT detectors on XY stage (100 x 100 mm stroke), readout by the custom ADC boards
- 2 x trigger/start time scintillators – 27 mm high, 10 cm long, 5 mm thick. Each readout with 2 PMTs.
- Fibre detector, prototype for PAS R3B system, 120 cm long, 20 cm high, 1.5 mm thick (6x250 μm fibres), readout with MPPC_ROB3 system. Readout by PADI/TAMEX.
- GADAST crystals (SFRS), readout by the VME Mesytec board.

All detectors synchronized by the time stamp (WhiteRabbit or Heimtime) and get the same trigger (except of ALPIDEs)

General goal of the experiment – measurement of position resolution and efficiency

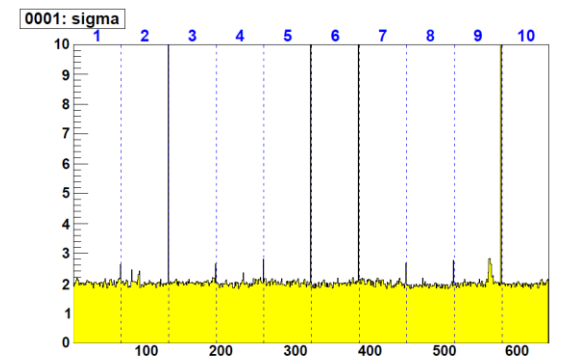
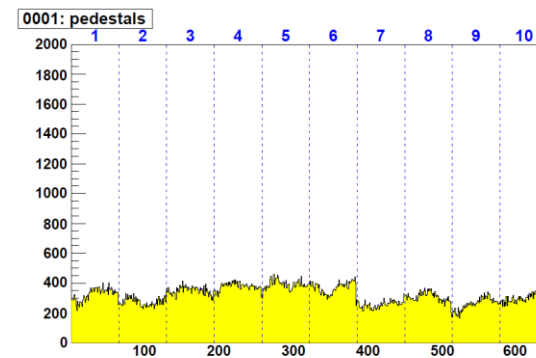
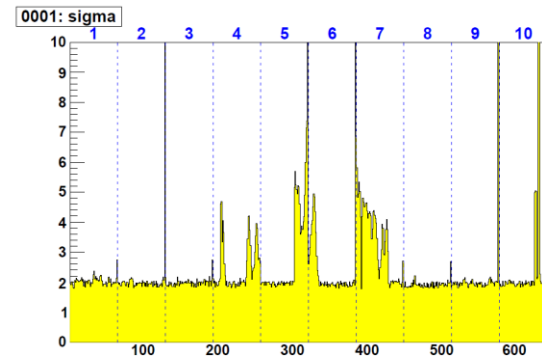
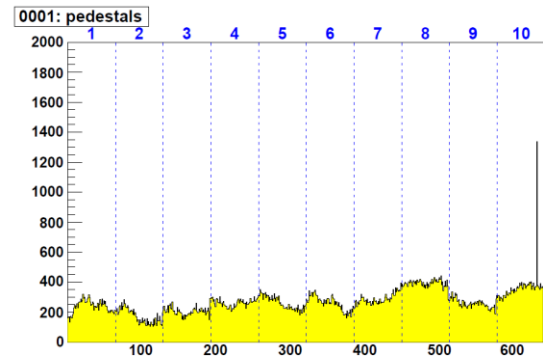
Setup layout in the cave



- Platform - beam scintillator + 3 single ALPIDE + 2 FOOTs on XY stage + Fibre scintillators + 3 single ALPIDE + beam scintillator
- Table 2 - GADAST

***Plus PANDA
Luminosity setup (MuPix
detectors) and PANDA MVD
(Si microstrip detectors)***

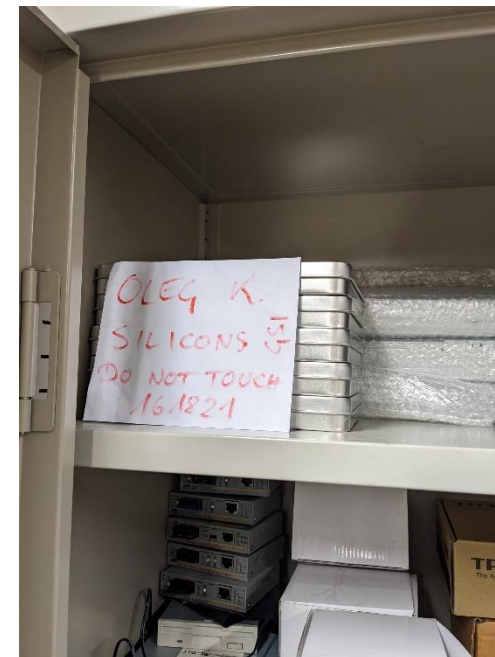
FOOT – 5 new detectors



- 5 new detectors bought
- Components (FE boards, ASICs) ordered
- Mounting at INFN Perugia
- Few bad ASICs...

Detectors stored at CERN

To be tested with IR laser

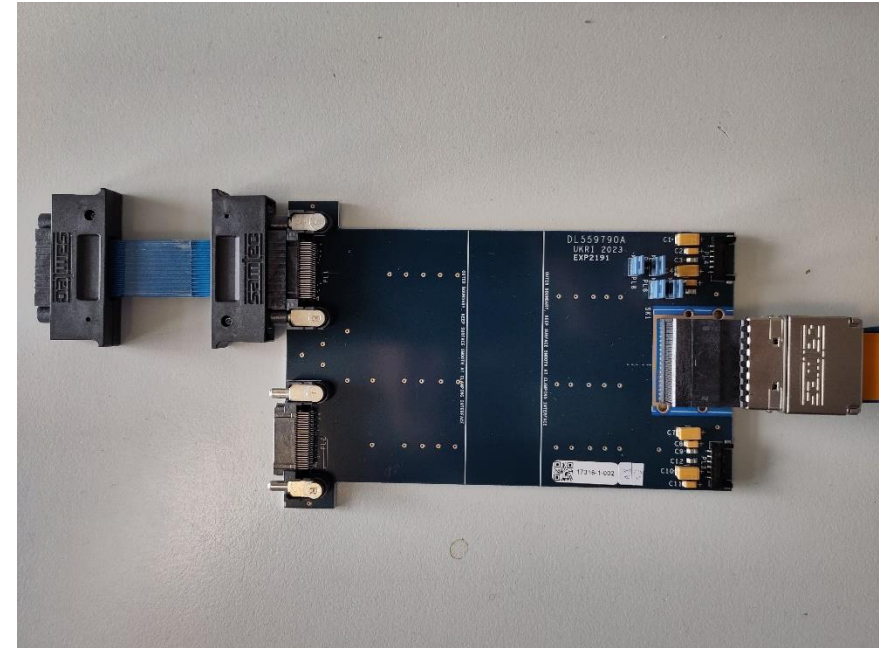


Baseline variation at high rate and trigger rate limit is related to the FE design

Possible to improve (CEA Saclay?) but for new detectors only

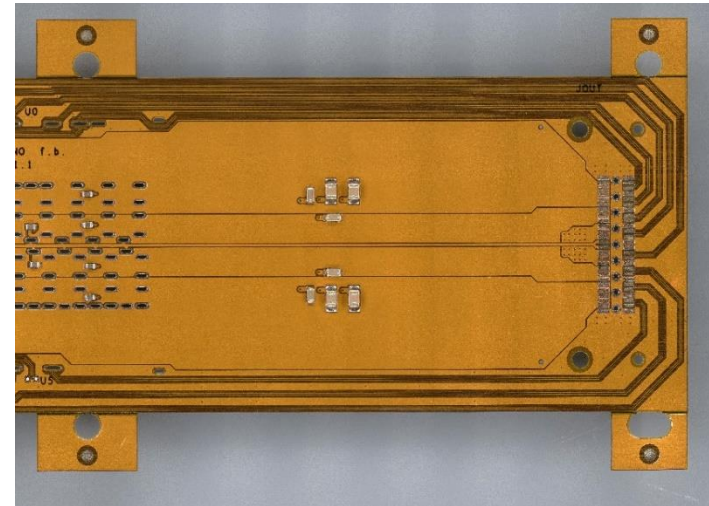
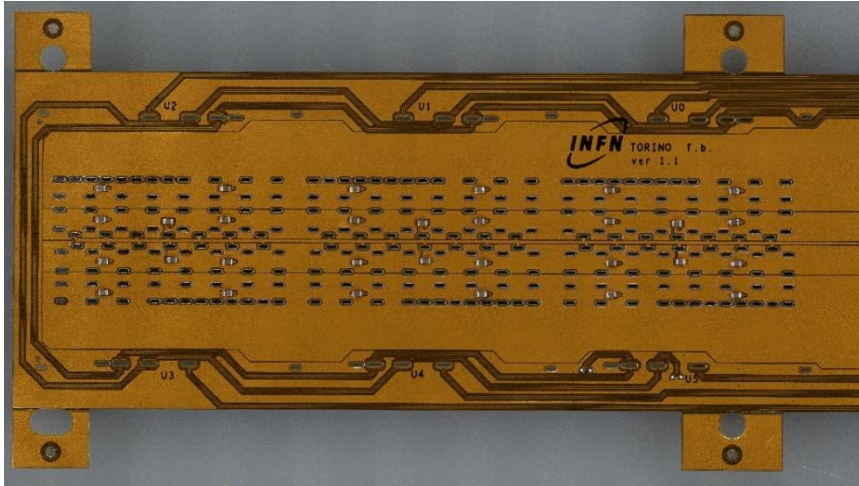
ALPIDE Flex

- Thin flexible cable (100 μm) for 6 detectors
- 3 flexes per tracking station
- Three versions:
 - Al-based (for wire bonding, CERN, will be available in July)
 - Cu-based (for wire bonding, UK, will be available in June)
 - Al-based (for SpTab bonding, LTU, Ukraine, 4 are available, more can be ordered, more expensive, need modification of tools)
- Gluing/positioning possible at INFN Turin, in Daresbury – start from December
- Wire and SpTab bonding possible (up to now) only at GSI



*Adapter board between the flex and MOSAIC
One board for two flexes and two MOSAICs
Can serve as a vacuum feedthrough
Designed and produced at Daresbury Lab, May 2023
Tested at GSI, works
4 units are supposed for the vacuum chamber, 1 – for lab tests*

FPCs for ALPIDEs



- Cu-based FPCs produced (2nd attempt) at Glasgow, jointly with AMBER
- 4 boards brought to GSI on Nov 06
- Connectors will be mounted during this week
- Monting at INFN Turin – next (and over next) week
- More FPCs are on the way to GSI

One Al-based FPC made at CERN
Connector will be mounted this week
Mounting at INFN Turin – next (and over next) week

If everything works, 5/6 working FPC – 2 full tracking stations in the 1st or 2nd week of December

TRT in the future

- Stage 1 – 1 + 1 full tracking stations now, 3 + 3 full stations in 2024/2025
- University of Compostella / University of Coruna have grants up to 2027
- Experiments with two-arms tracker ALPIDE-based only are possible start from 2026
- Stage 2 – design of the FPCs, holding structures started in UK
- Prototypes in 2024
- Sensors are not yet ordered
- Readout – MOSAIC, Freiburg AMBER board or R3B common board?
- 2 (3?)-barrel tracker can be built in 2026