

ALPIDE characterization

Monika Varga-Kofarago

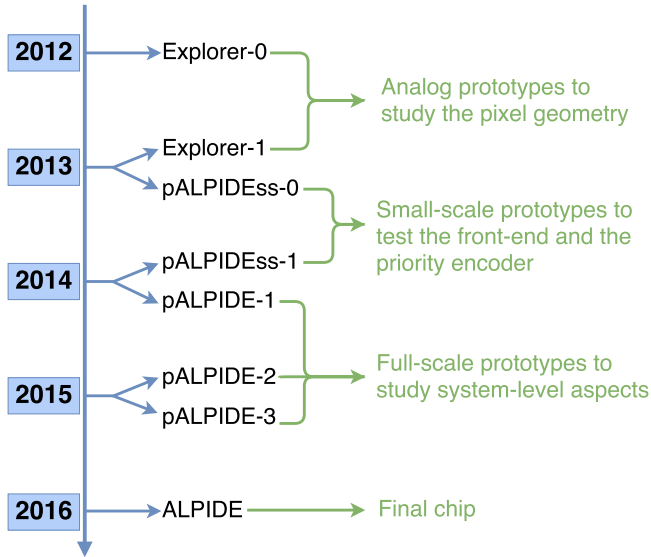
varga-kofarago.monika@wigner.mta.hu

16th April 2018



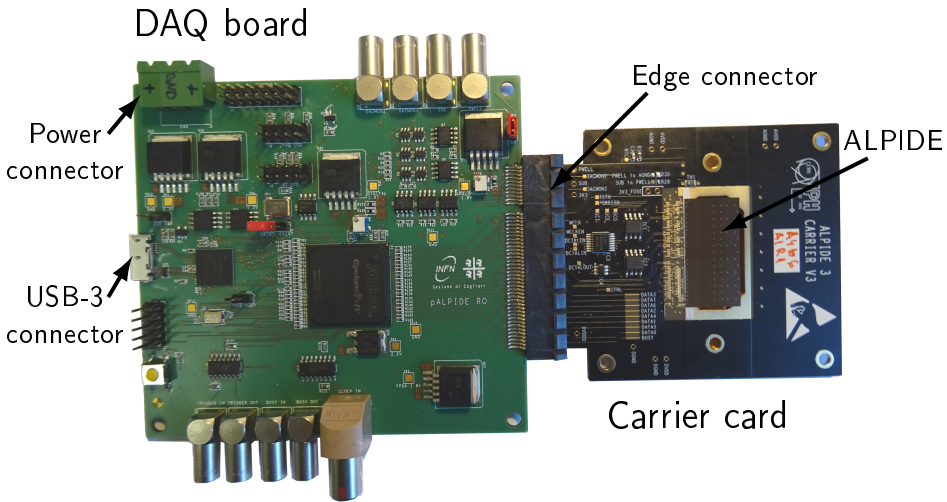
- 3 years at CERN during PhD
- 1.5 years working on characterization of ALPIDE prototypes
 - Simulation for the optimization of test beam setup
 - Test beam measurements
 - Test beam software preparation
 - Analysis of almost all pALPIDE-1 data
- Now stationed in Budapest at Wigner RCP
- Still continuing some support and analysis for the ITS
- A bachelor student is joining me in this project

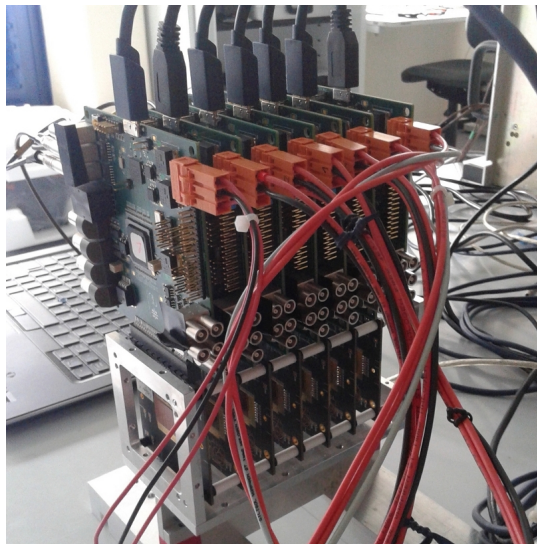
Prototypes

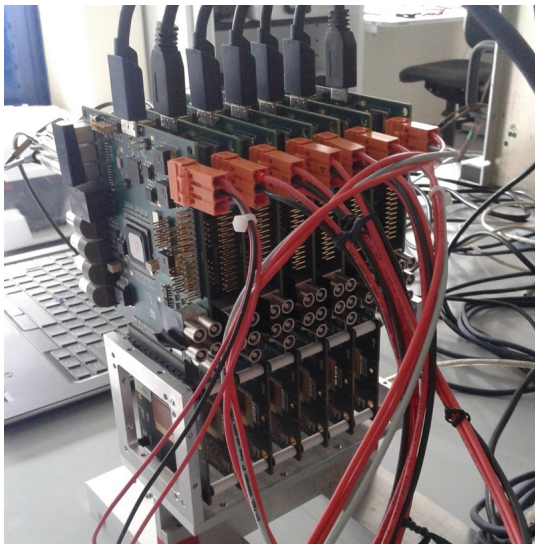


Optimization:

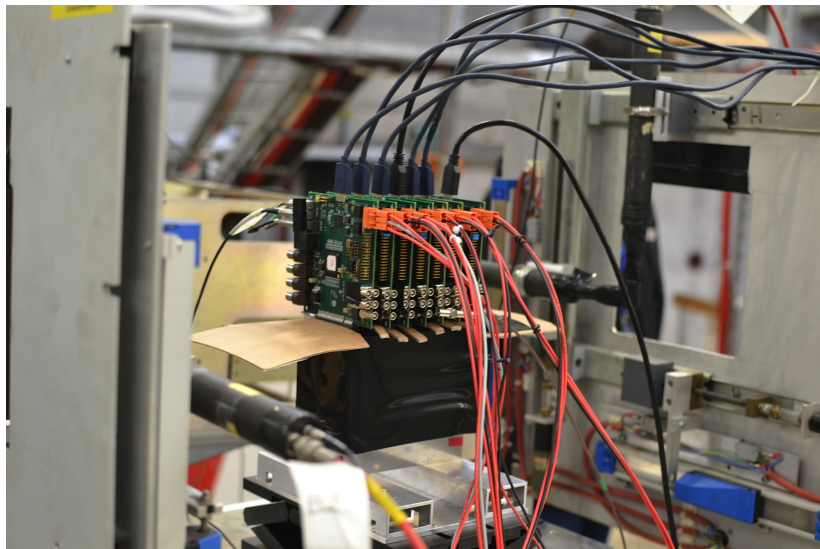
- Distance between the layers
- Which layer is the DUT
- Number of the layers
- Effect of having air or vacuum between the layers
- Momentum of the particles
- Material budget
- Resolution of the tracking planes



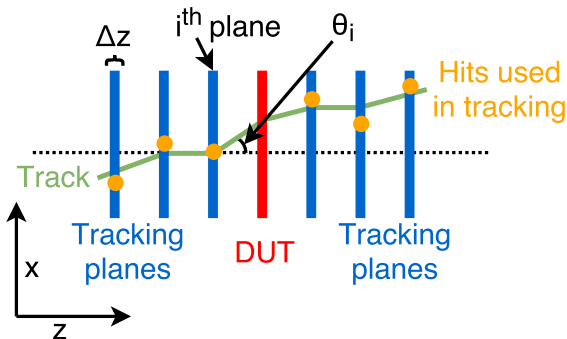




- Several test beam campaigns
- PS, SPS, DESY, Frascati
- e^\pm , pions
- 200 MeV/c – 120 GeV/c



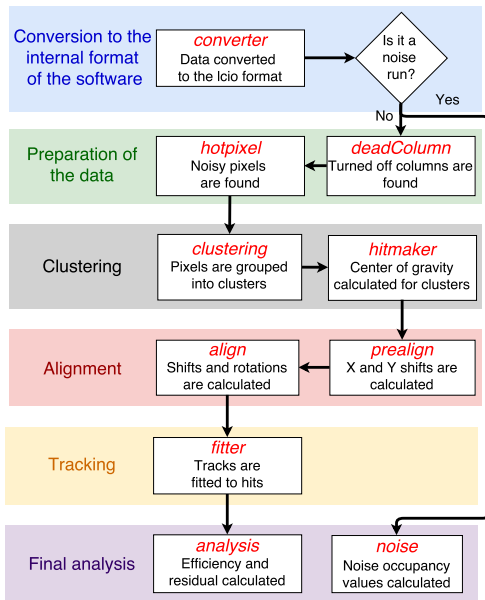
- EUDAQ: test beam data taking
- EUTelescope: test beam analysis
- Developed at DESY
- Actively supported (both from DESY and the ITS team)
- ALPIDE is already integrated
- eutelescope.web.cern.ch
- Twiki:
<https://twiki.cern.ch/twiki/bin/viewauth/ALICE/ITS-WP5>



- Broken line fit
- χ^2 minimization

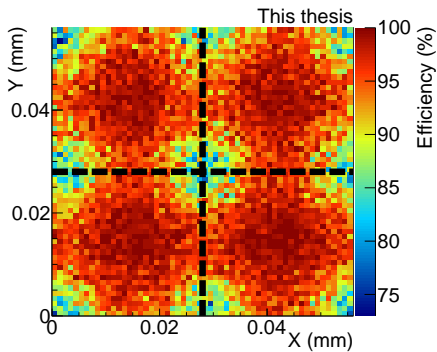
$$\chi^2 = \sum_{i=1}^N \left(\frac{y_i - p_i}{\sigma_i} \right)^2 \Big|_{i \neq i_{DUT}} + \sum_{i=2}^{N-1} \left(\frac{\theta_i - \theta_{i-1}}{\Delta \theta_i} \right)^2$$

EUTelescope – analysis steps

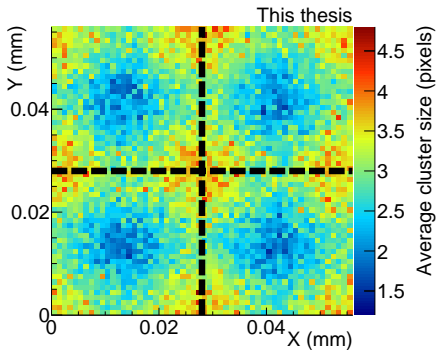


Efficiency and cluster size dependence on impinging point

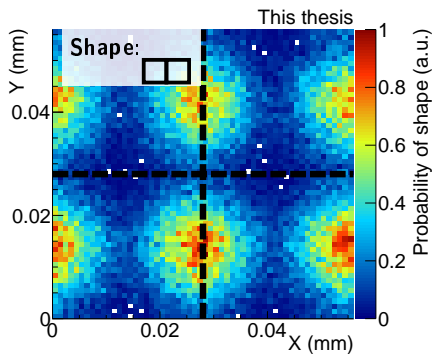
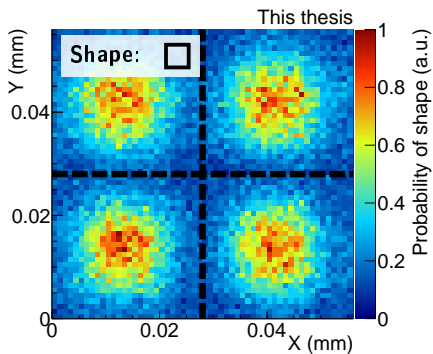
Efficiency



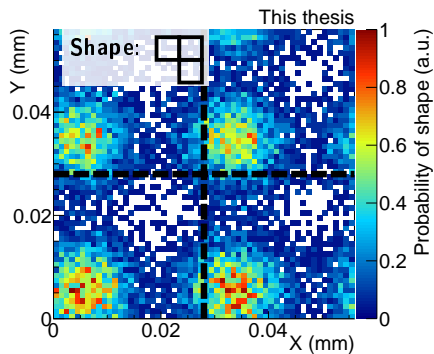
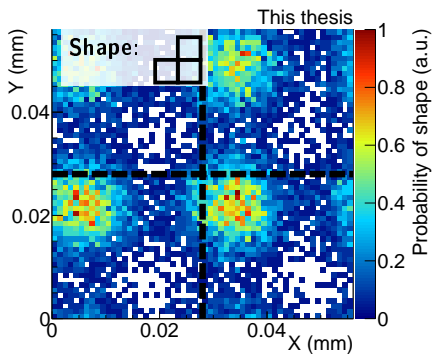
Cluster size



Cluster shape dependence on the impinging point



Cluster shape dependence on the impinging point



Thank you for your attention!