

Status of Sim/Reco of the PANDA Barrel DIRC and Test Beam Analysis

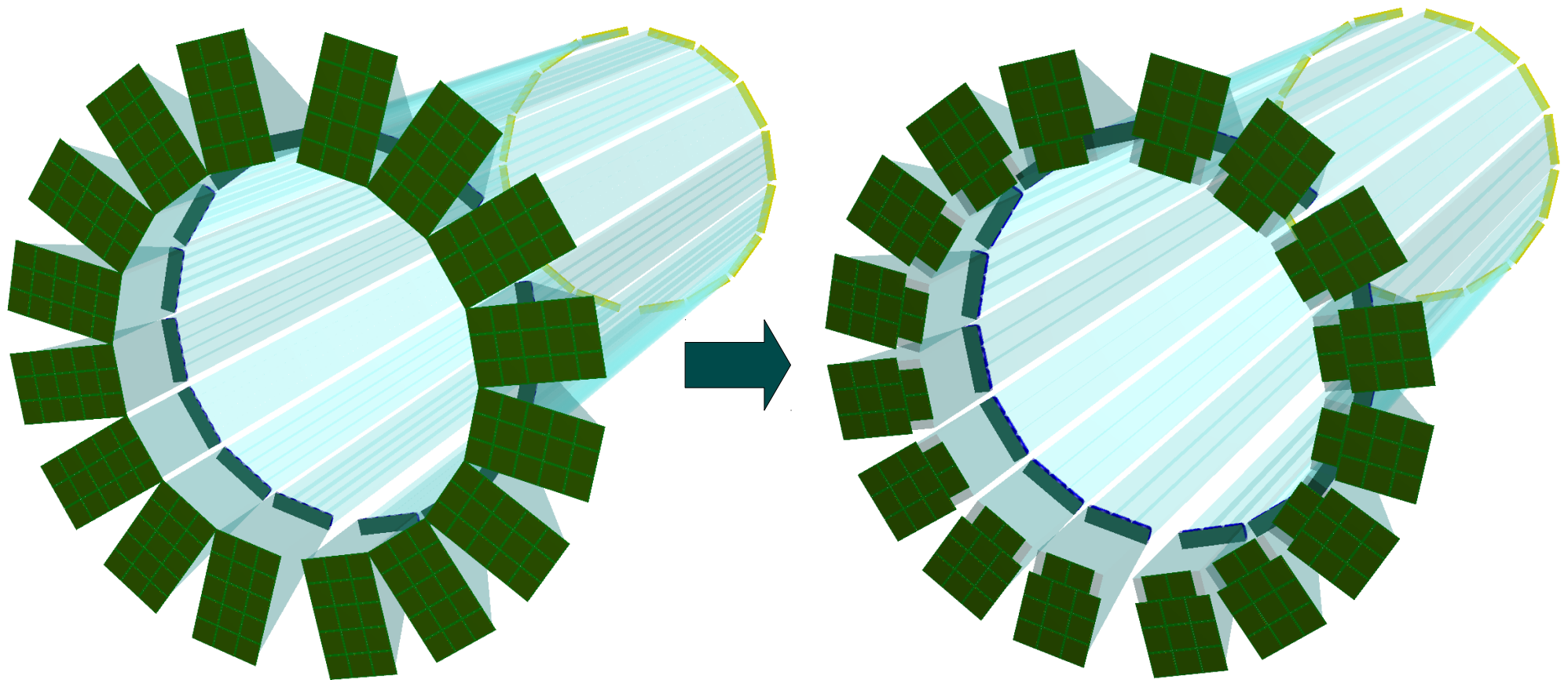
Roman Dzhygadlo



- Barrel DIRC geometry update
- Beam data analysis examples
- Summary & Outlook

PANDA meeting 02.16

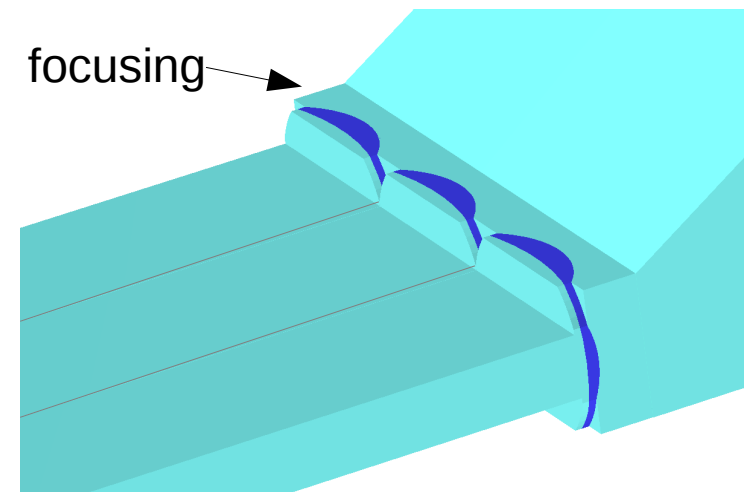
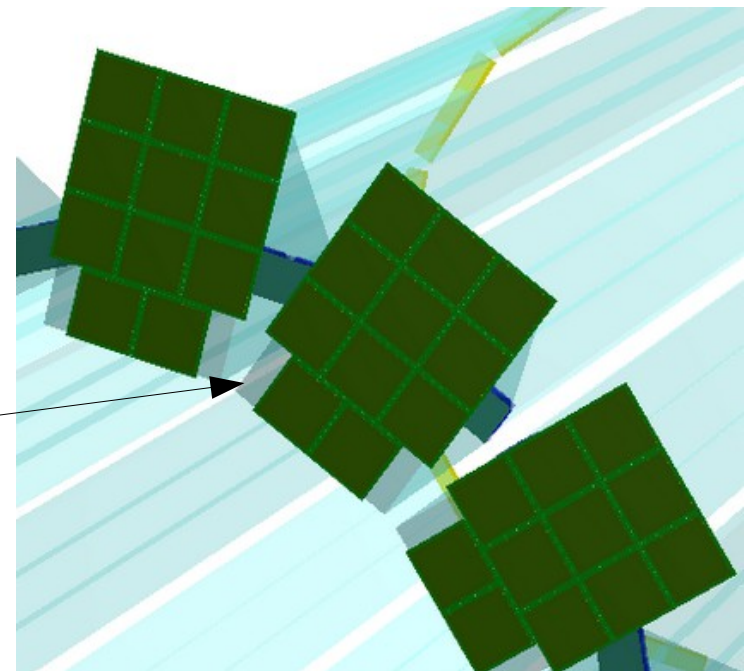
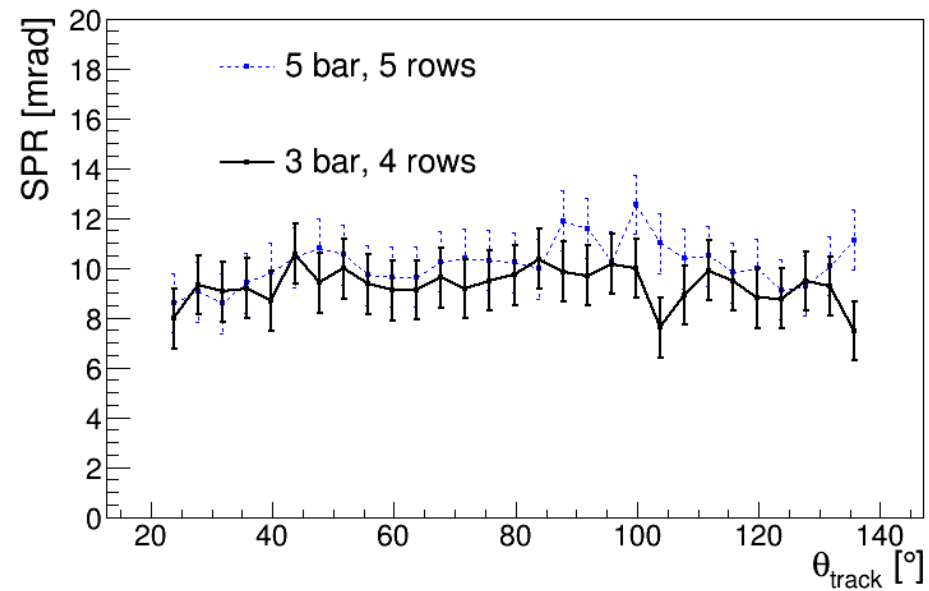
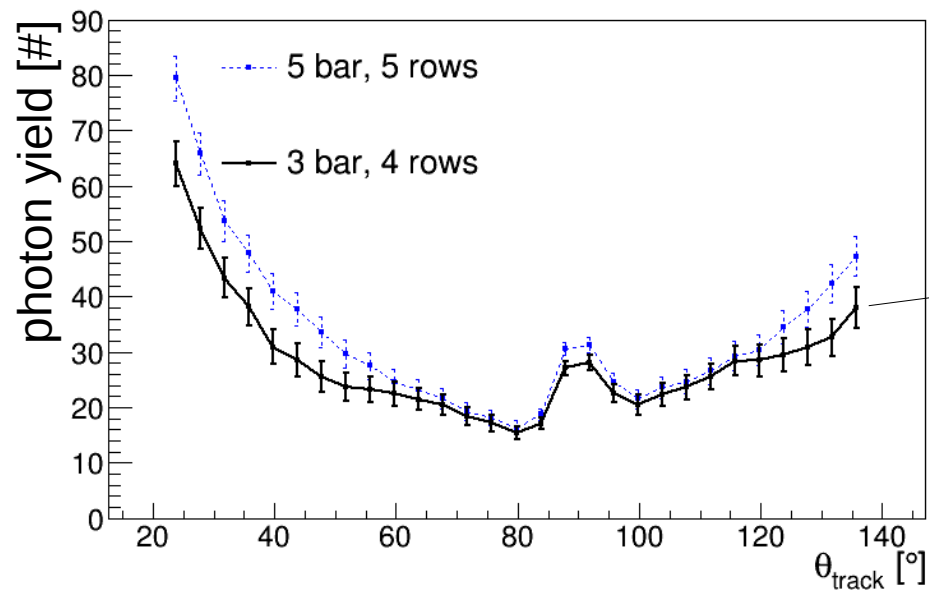
Barrel DIRC geometry update



- 5 rows of MCP (250 MCPs)
- ~38 degree prism
- 5 bars in section (each 32 mm wide)

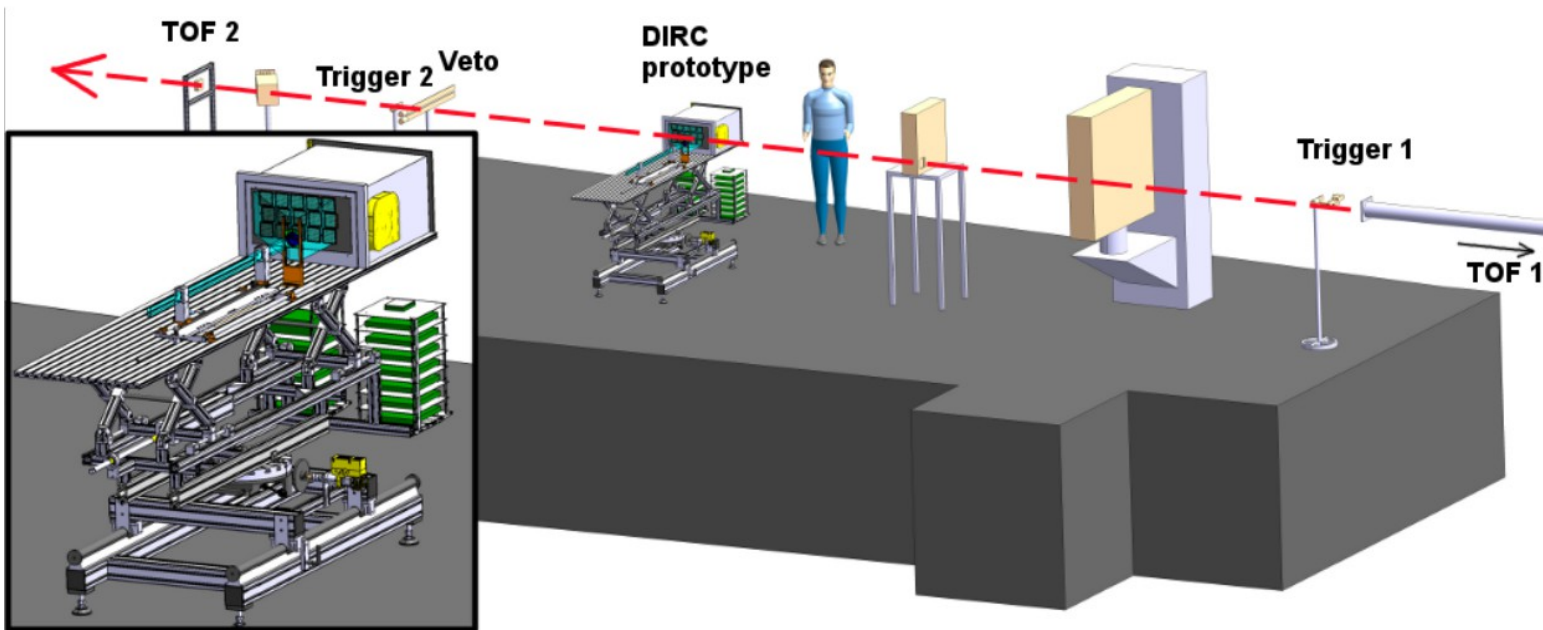
- 4 rows of MCP (176 MCPs)
- ~32 degree prism
- 3 bars in section (each 53 mm wide)

Performance check



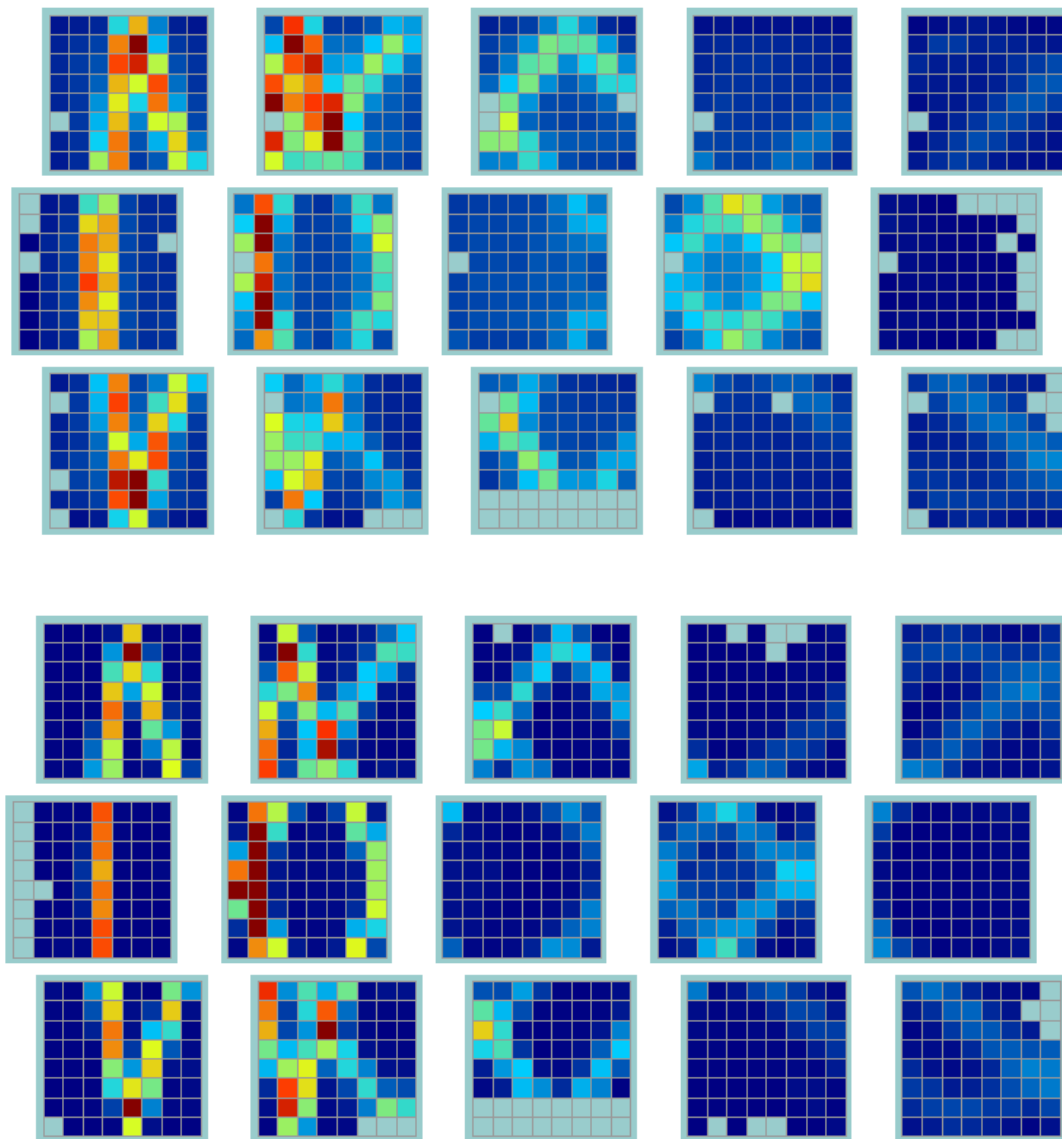
=> updated design is less expensive and still satisfy PANDA PID requirements (photon yield >15, SPR = 8-10 mrad)

Cern 2015 prototype test



- beam type: protons and pions
- beam momentum: 10, 9, 8, 7, 6, 5, 4, 3, 2 GeV/c
- TOF PID
- different configurations of the DIRC prototype

Hit patterns: bar with focusing @ 7 GeV/c



Data



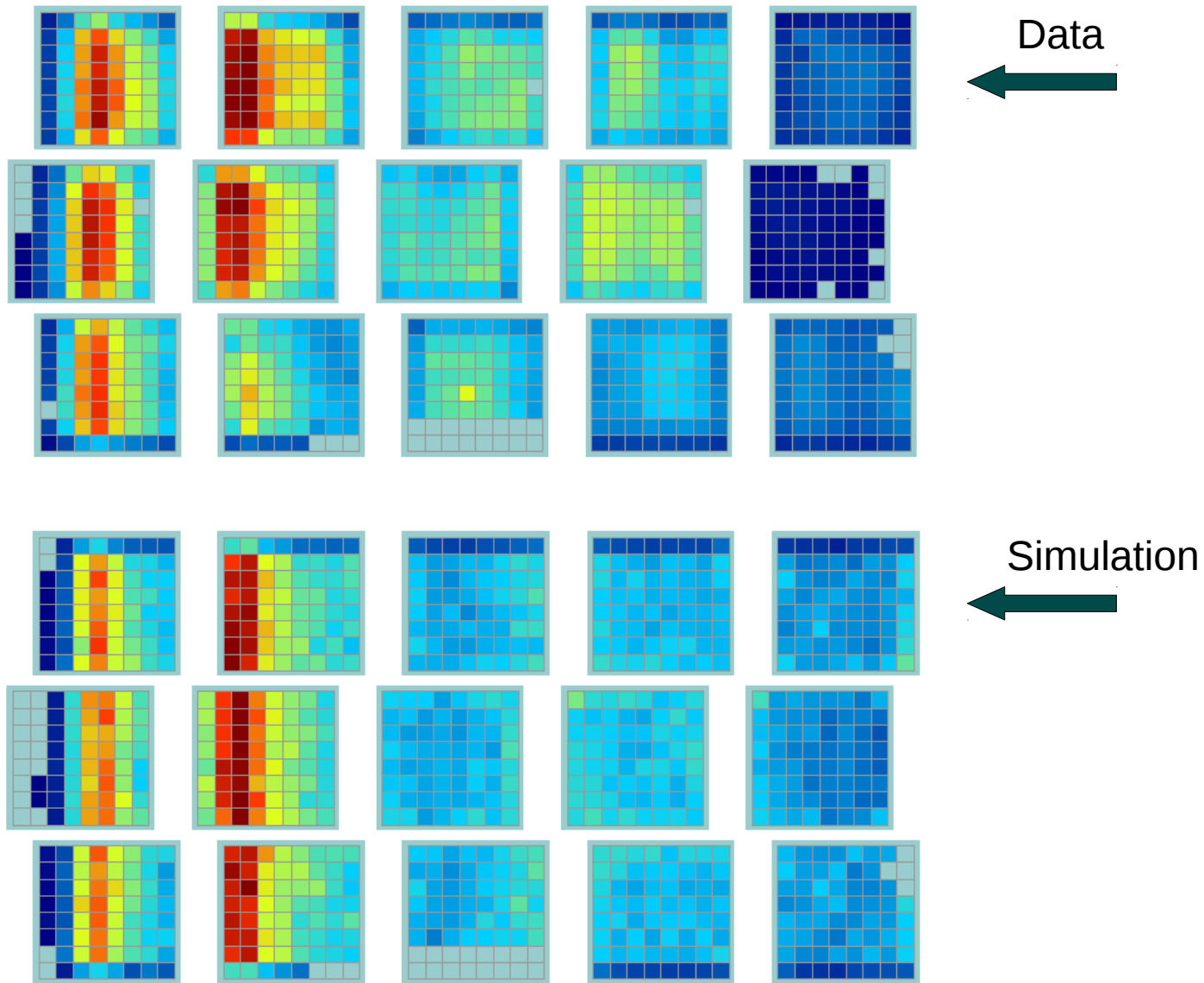
Simulation



**Standalone geant4
simulation includes:**

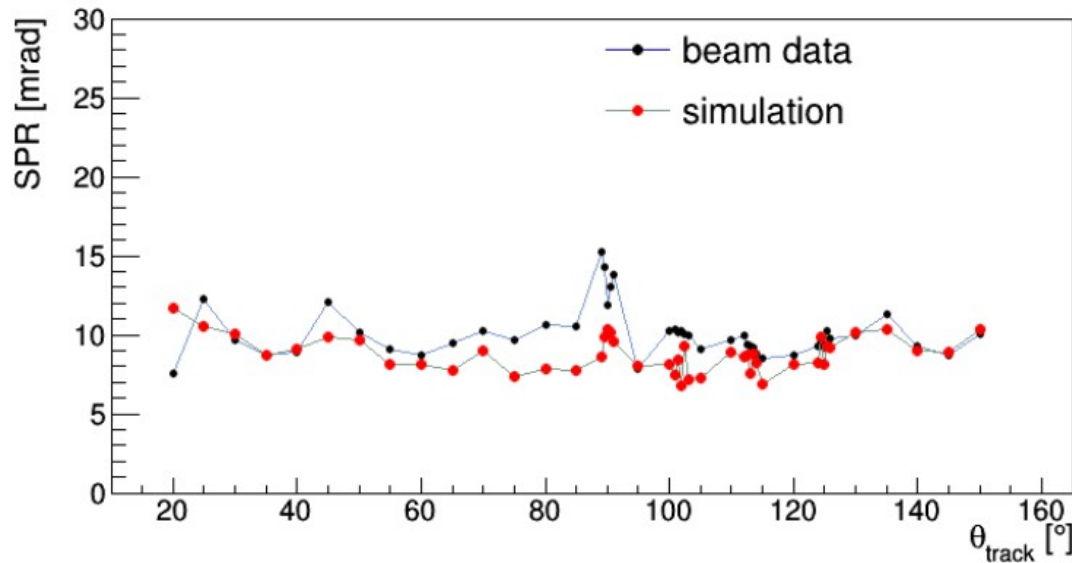
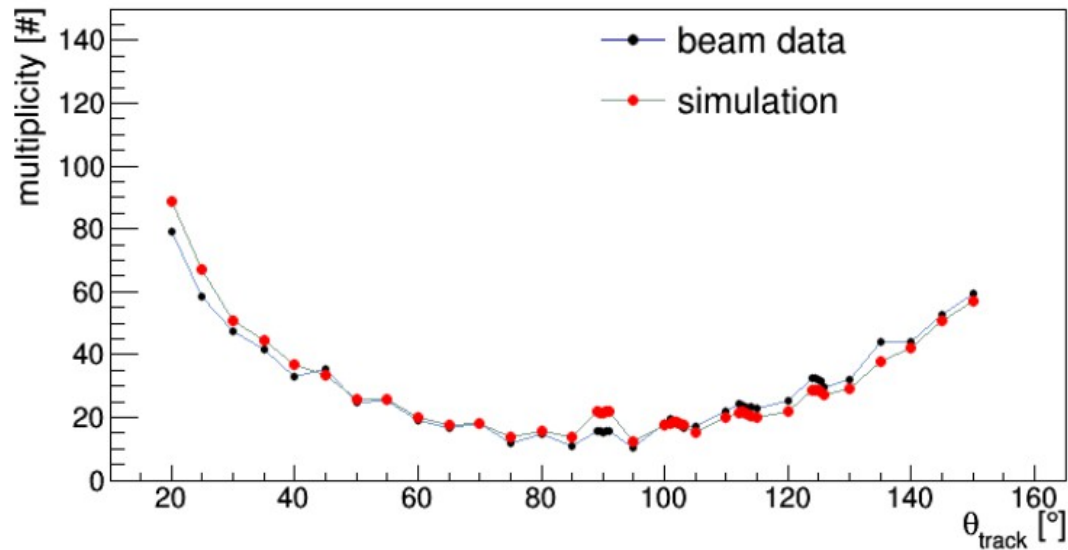
- dead channels
- quantum/collection efficiency
- charge sharing
- 200 ps time resolution

Hit patterns: plate w/o focusing @ 7 GeV/c



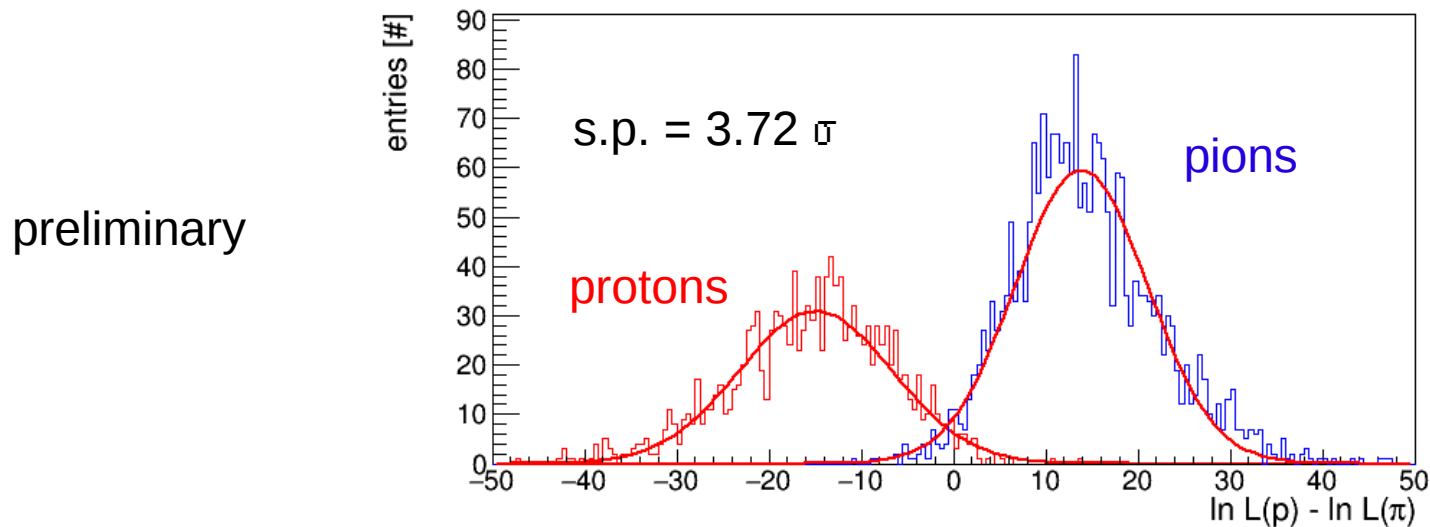
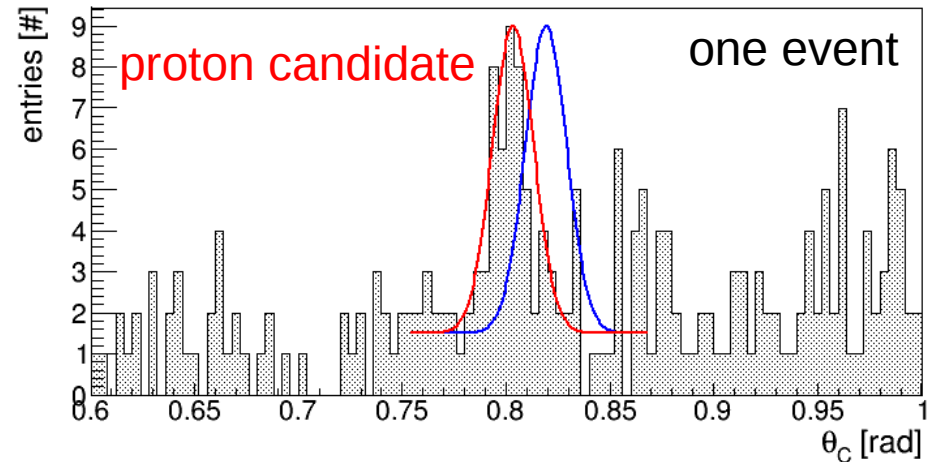
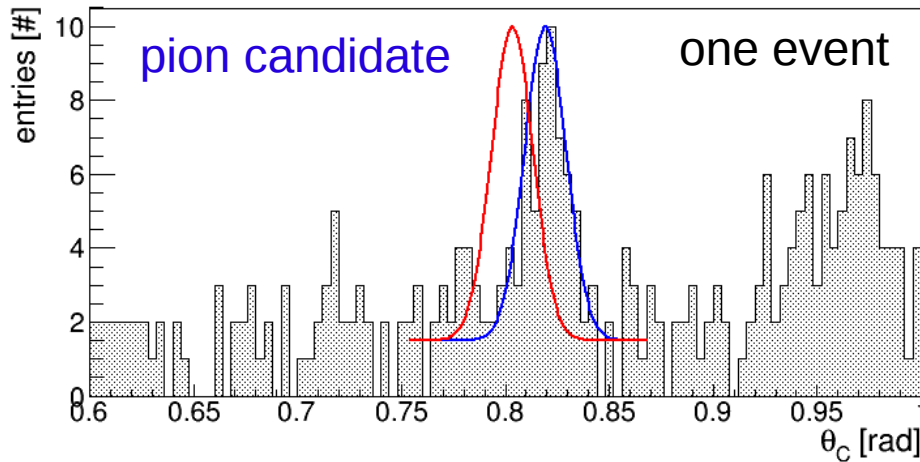
Geometrical reconstruction

bar with focusing @ 7 GeV/c
@ 125 degree



Geometrical reco.: likelihood calculation

bar with focusing @ 5 GeV/c @ 125.5 degree (beam_15178202056.hld):

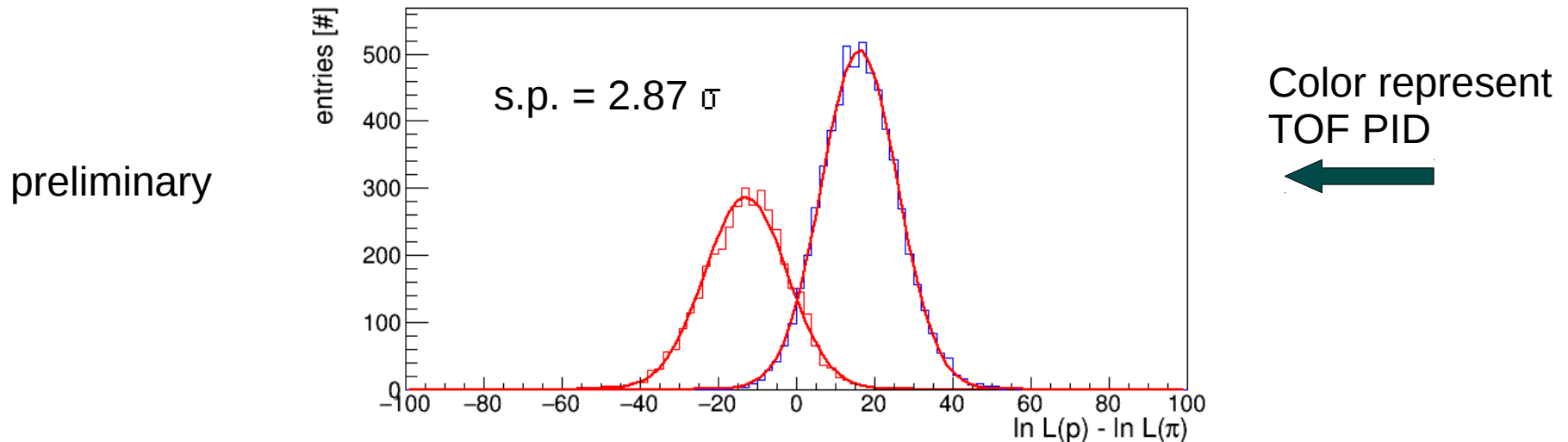
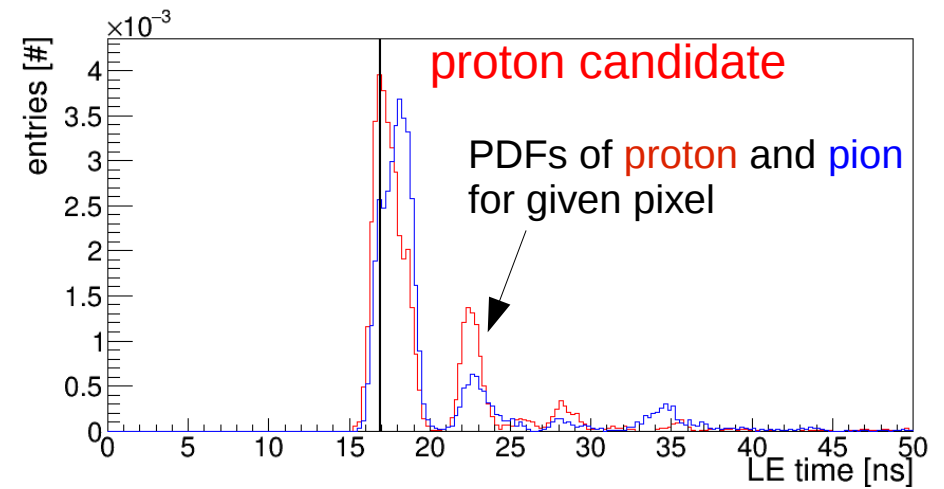
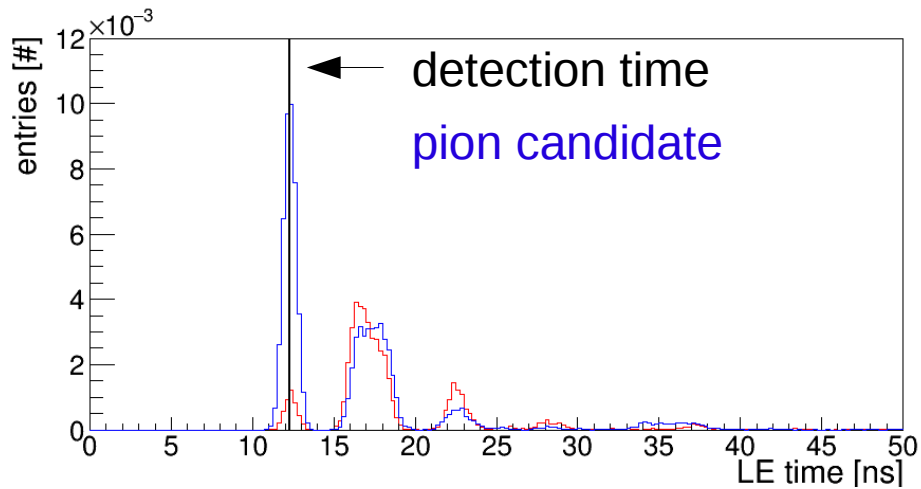


Color represent
TOF PID



Time imaging reconstruction. Example

plate w/o focusing @ 5 GeV/c @ 35 degree (beam_15184031335.hld):



Summary and Outlook

- Updated design with prism is less expensive and satisfies PANDA PID requirement for Barrel DIRC
- Data from cern 2015 prototype test are under systematic analysis
- Both geometrical and time-imaging reconstructions are working
- Ongoing activities:
 - improving detector alignment for cern 2015 prototype test
 - improving reconstruction algorithms
 - chromatic corrections

Thank you for the attention