mRICH Beam Test QA

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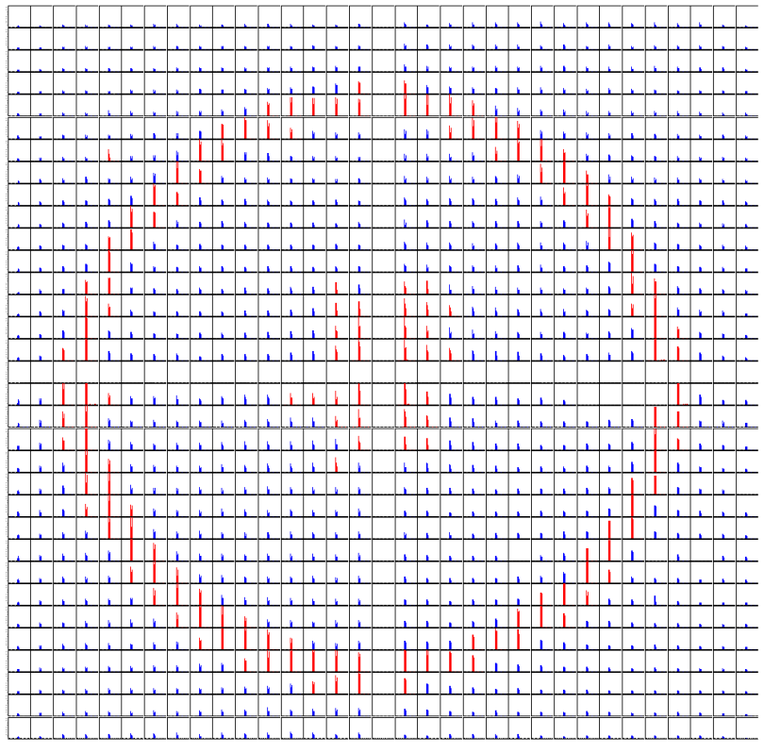
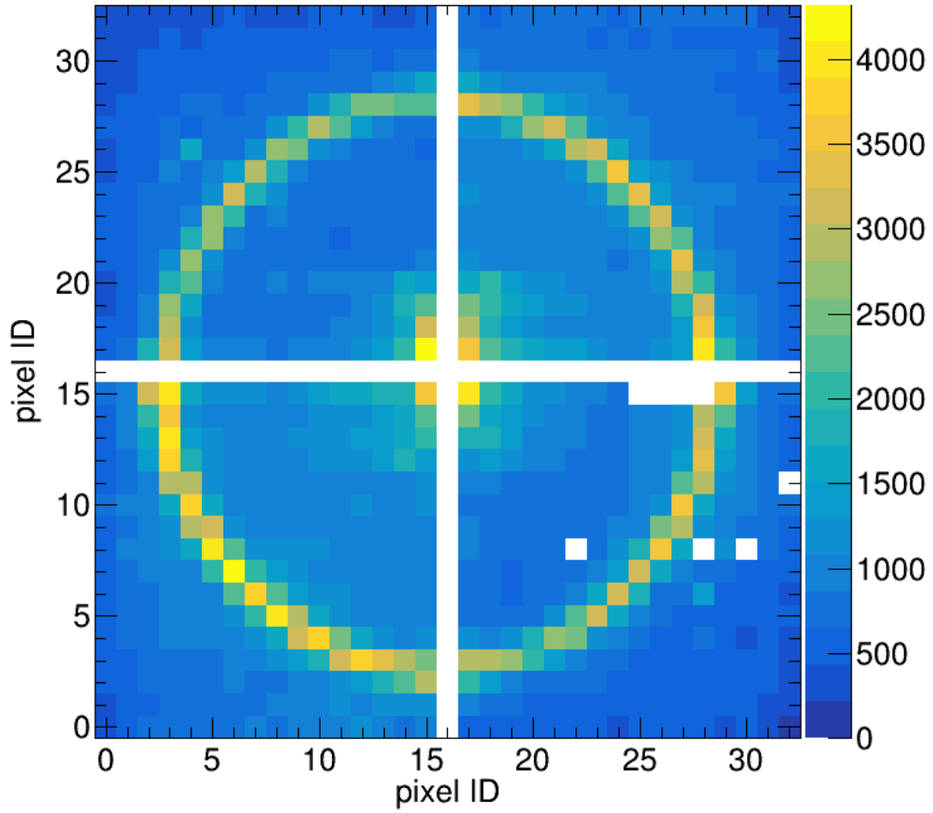
Data Summary

	PMT	MPPC
position scan	8 positions & 1M events	2 positions & 100K events
threshold scan	4 thresholds & 500K events	9 thresholds & 1M events
bias voltage scan		4 bias voltages & 1M events
temperature scan		5 temperatures & ~ events
angle	~11° & 1M events	proton
energy scan	3 energies & 500K events	meson

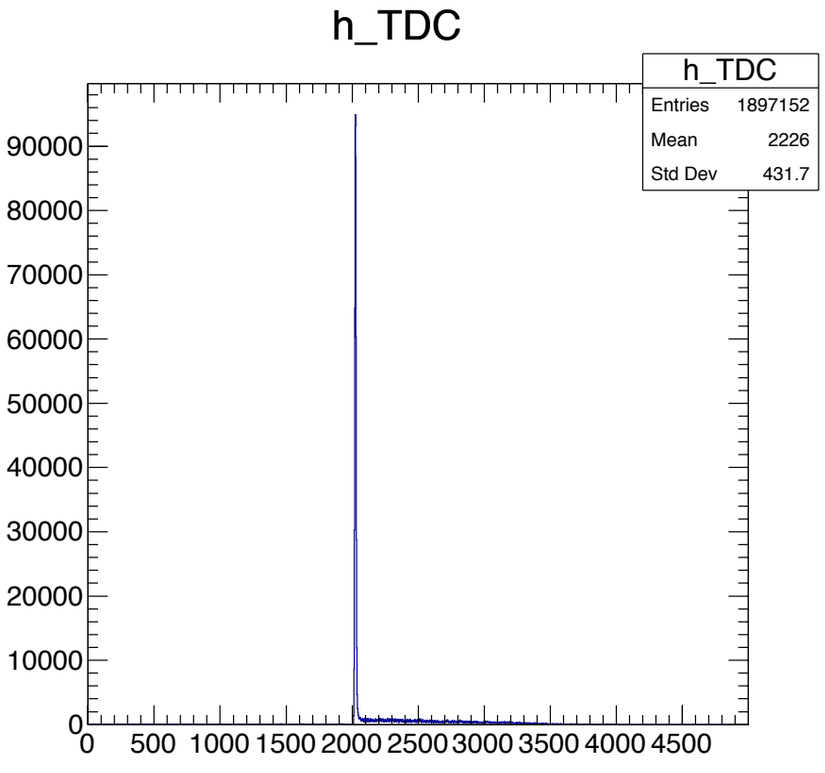
PMT Calibration Run

120 GeV/c proton





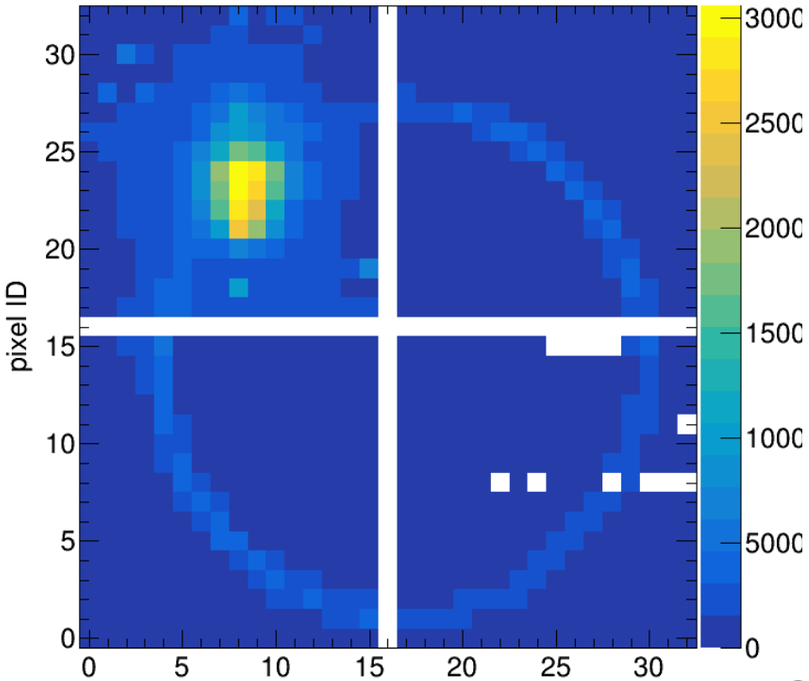
run182



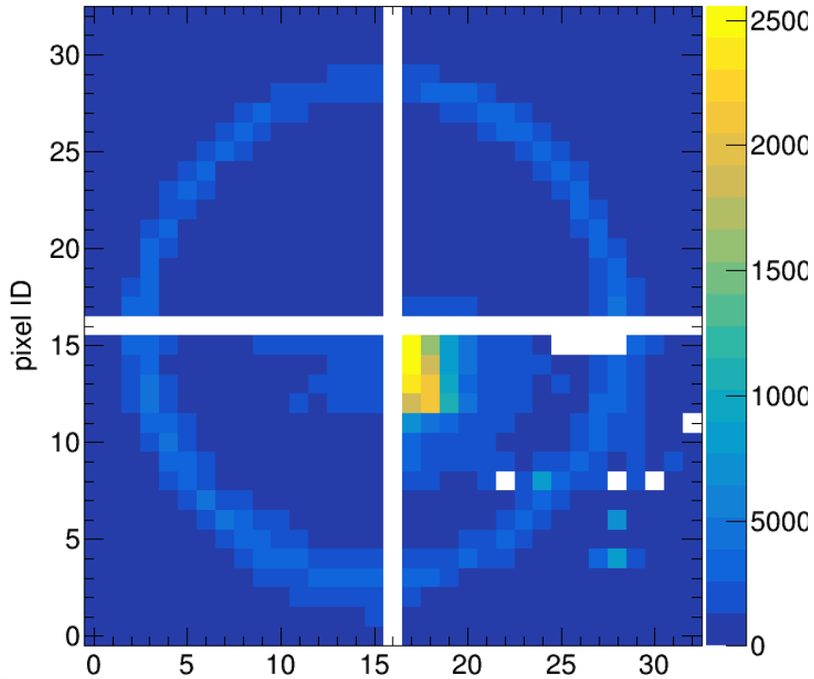
- **120 GeV/c proton & center**
- **determine tdc cuts**
- **determine mRICH geometry**
- **tune simulation**

PMT Position Scan

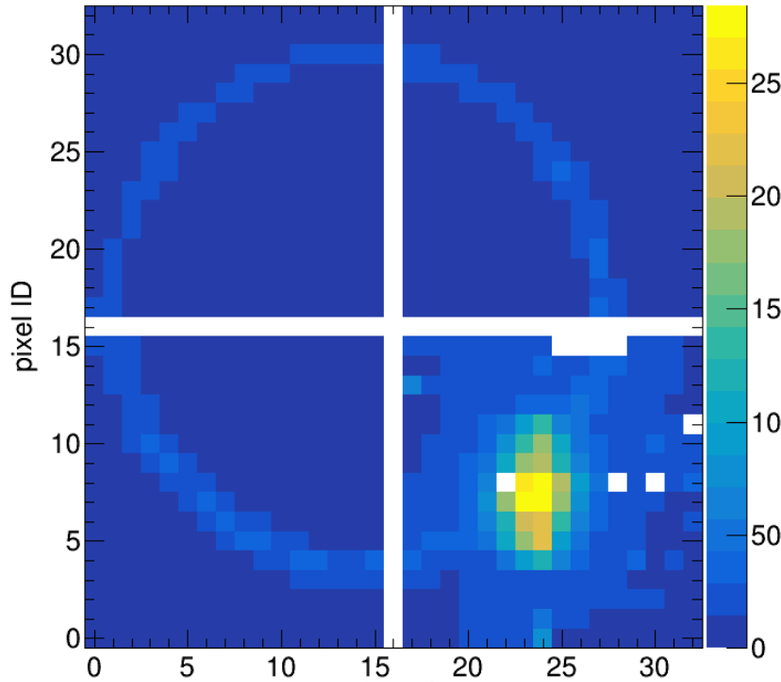
run24 120 GeV/c proton



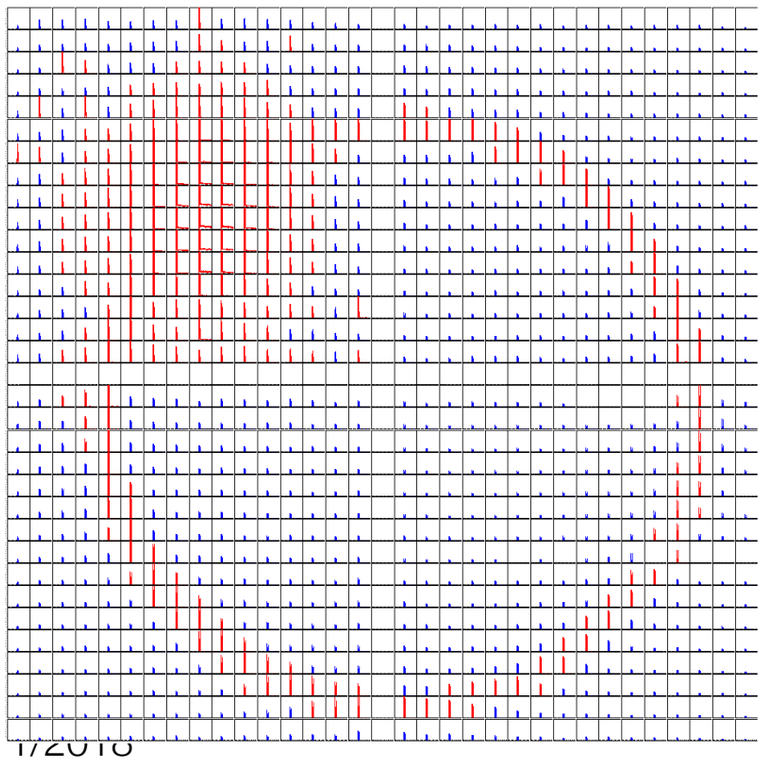
run120 120 GeV/c proton

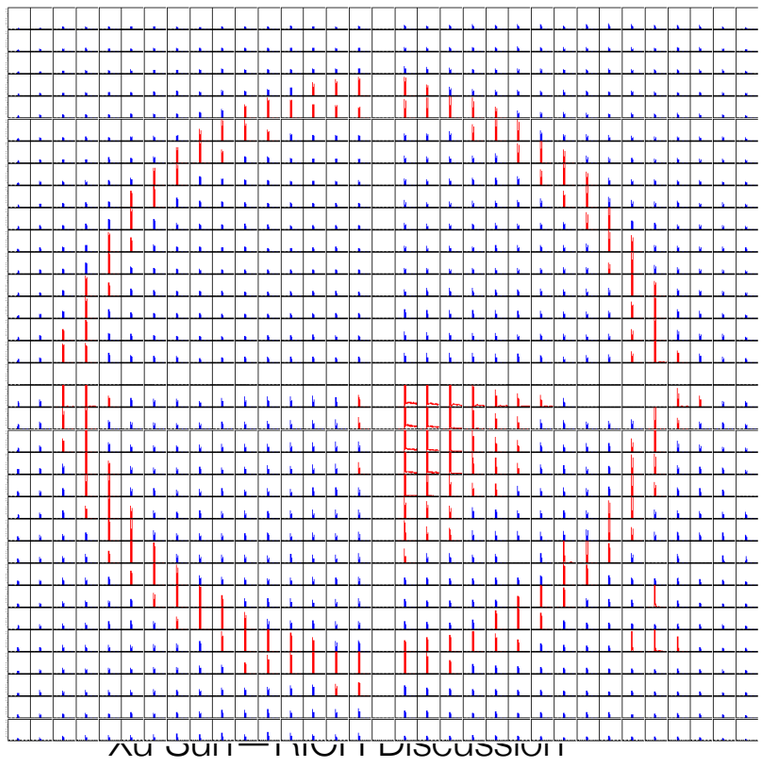


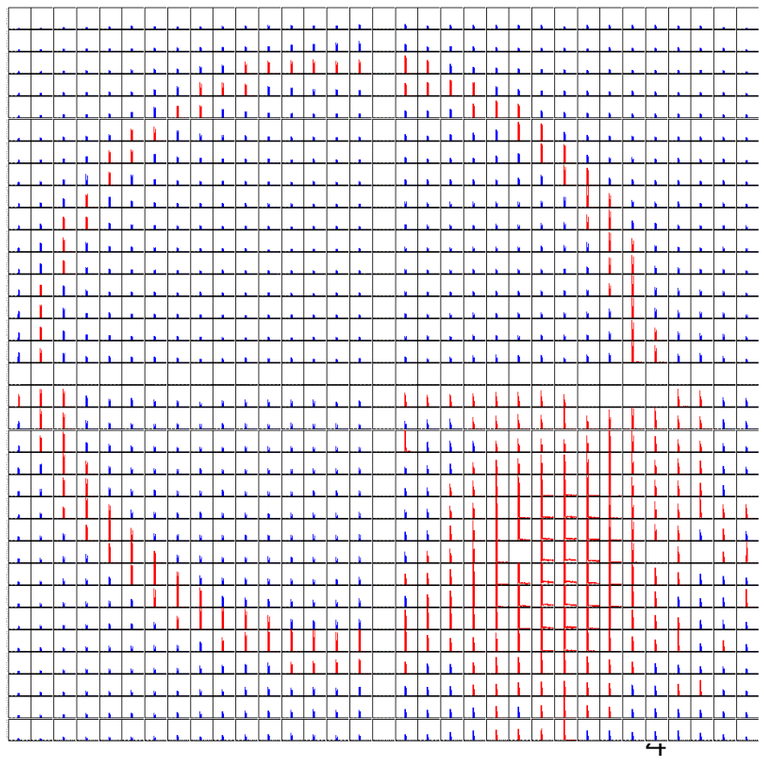
run124 120 GeV/c proton



50K events

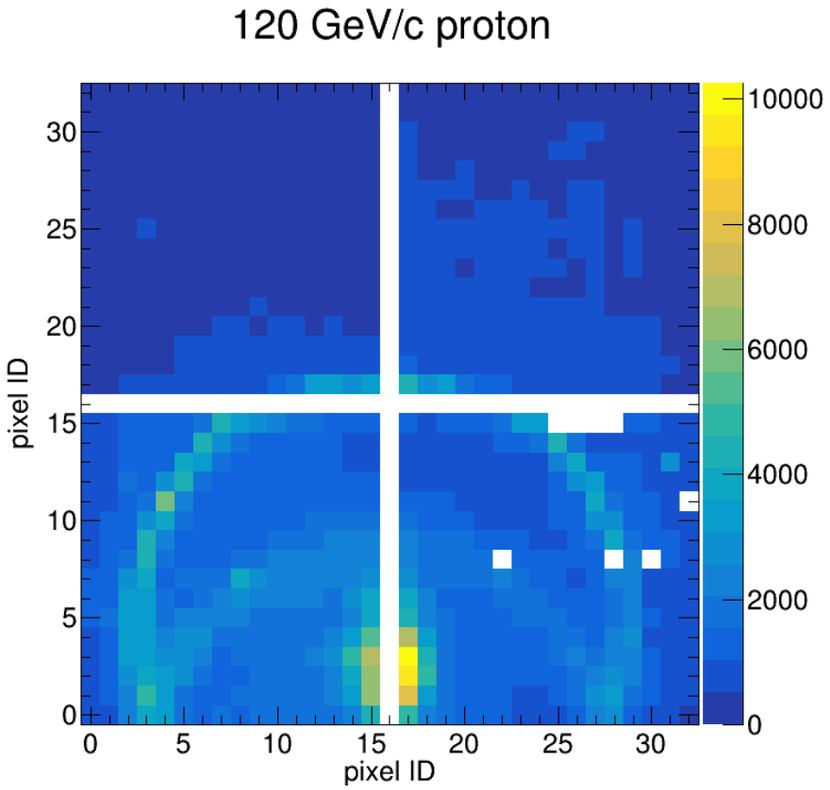




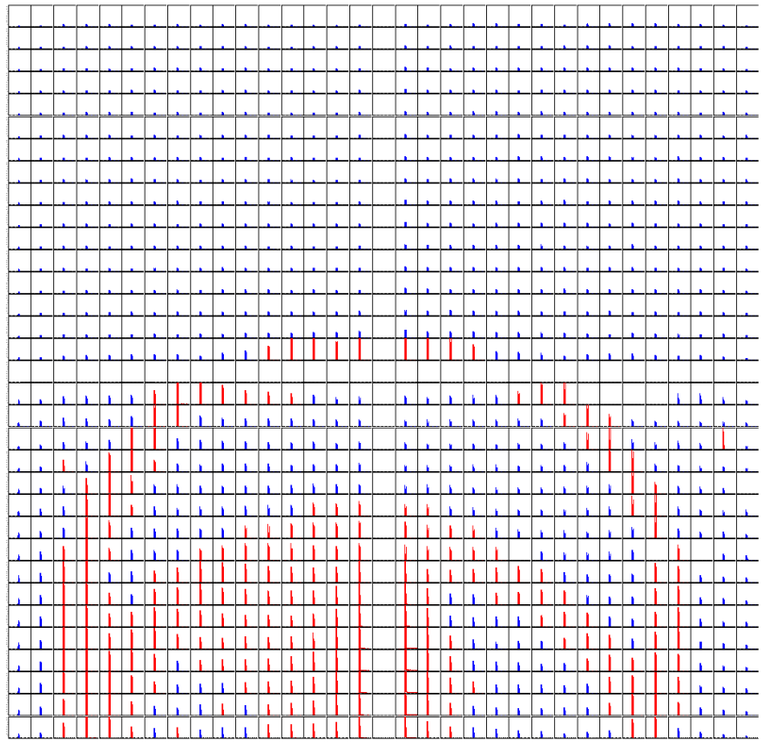


PMT Angle Run

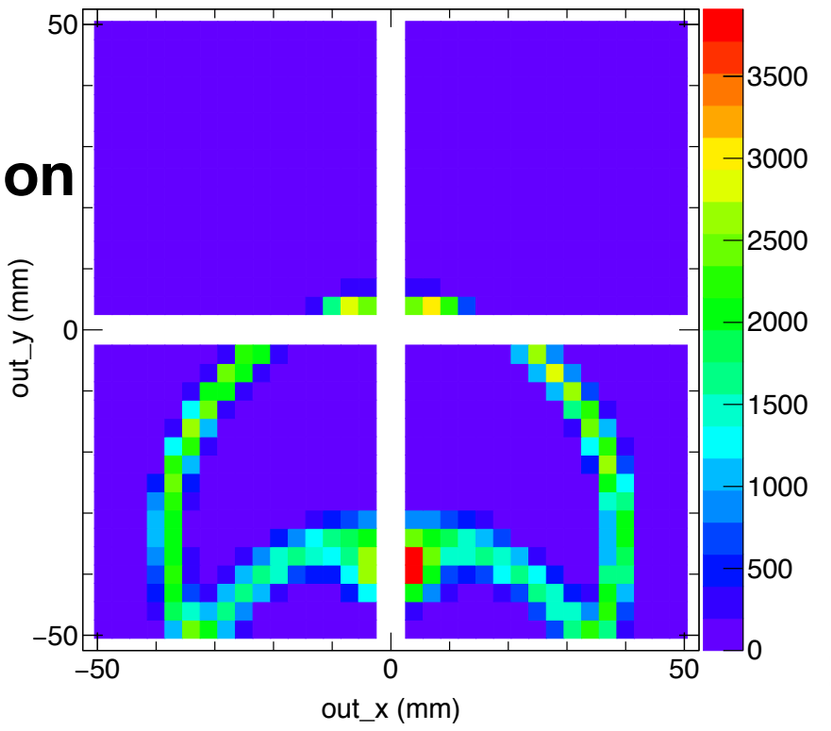
data



run 214



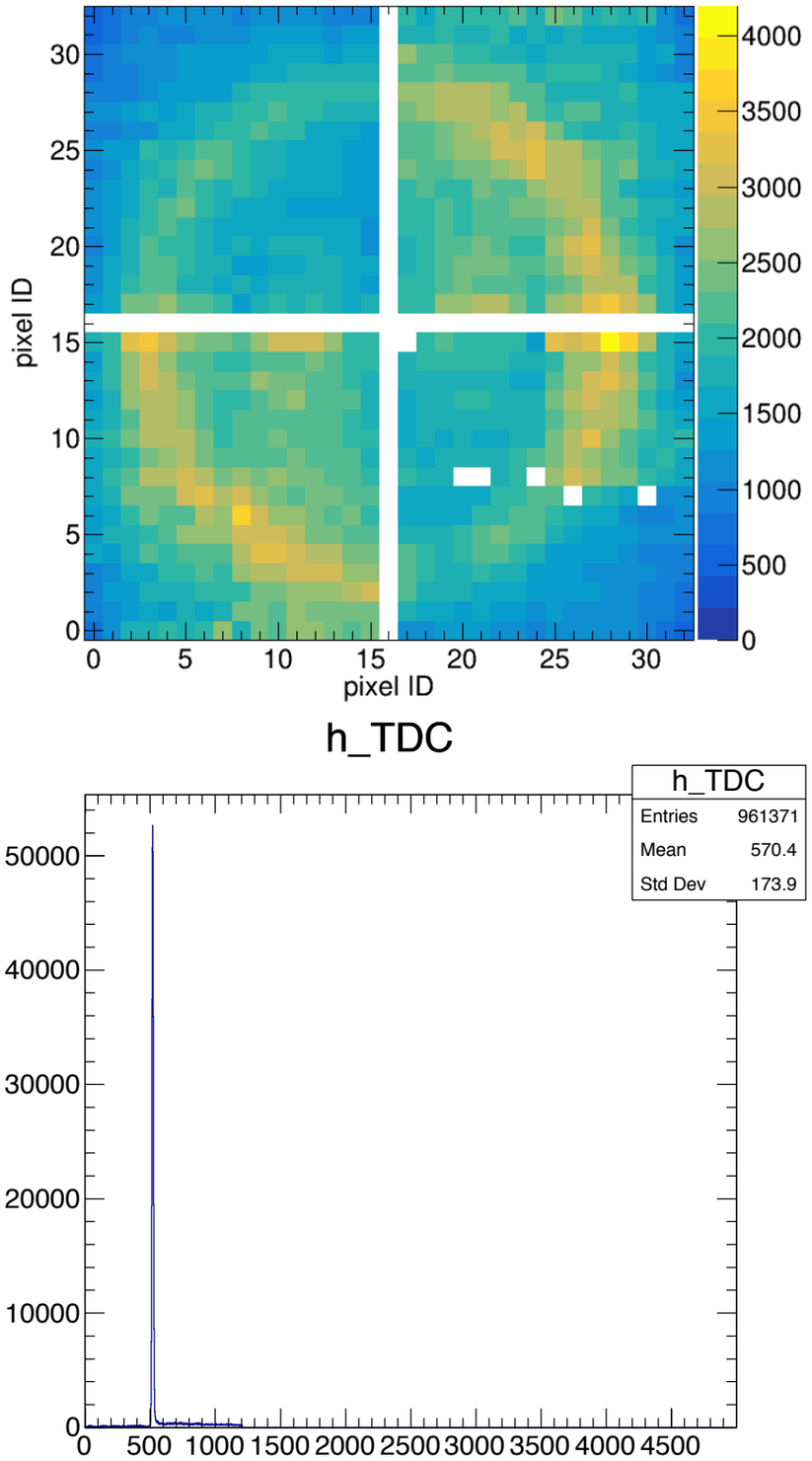
simulation



- **11º angle**
- **need to update mirror set of simulation**

PMT Meson Run

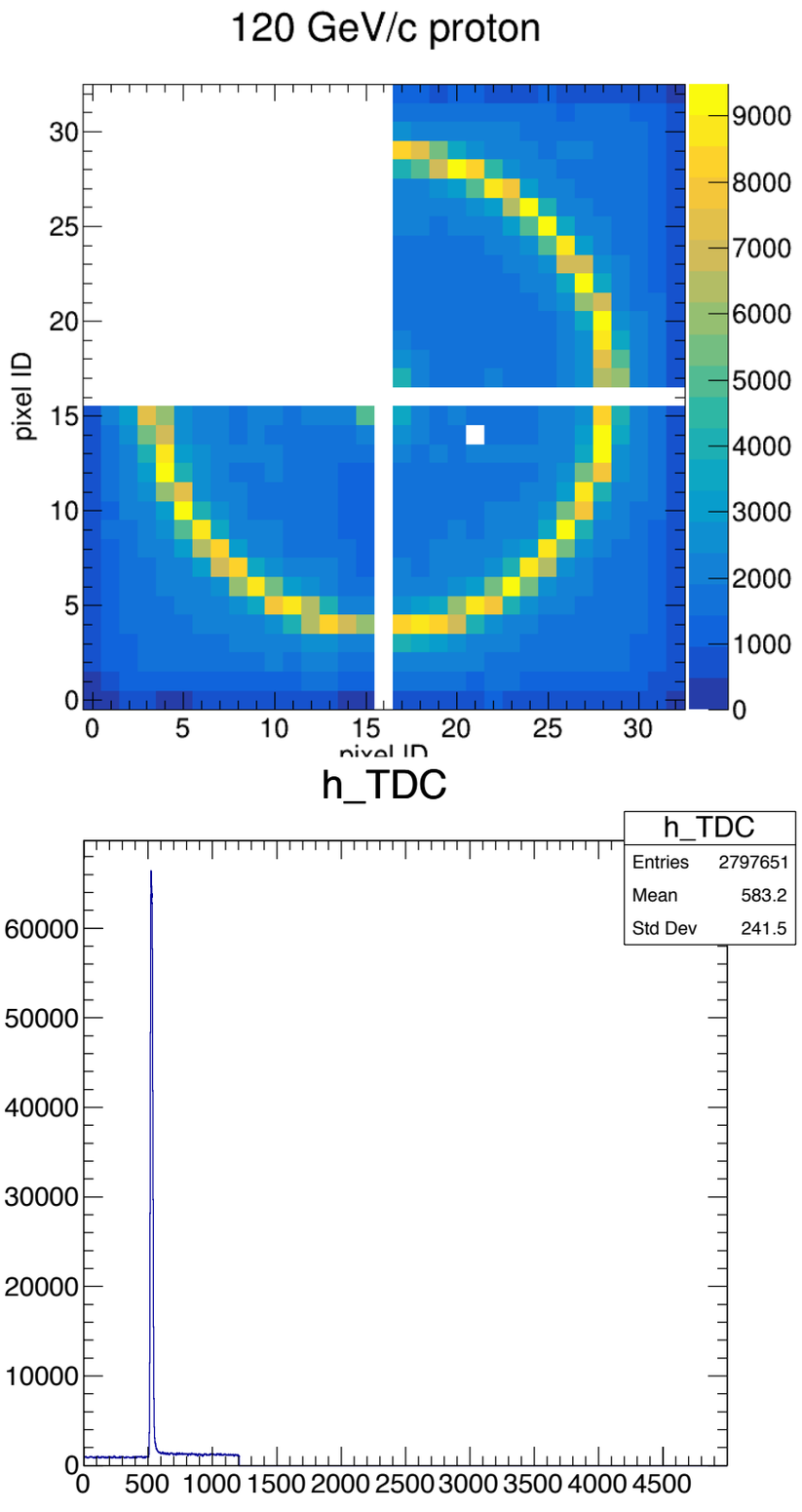
8 GeV/c meson



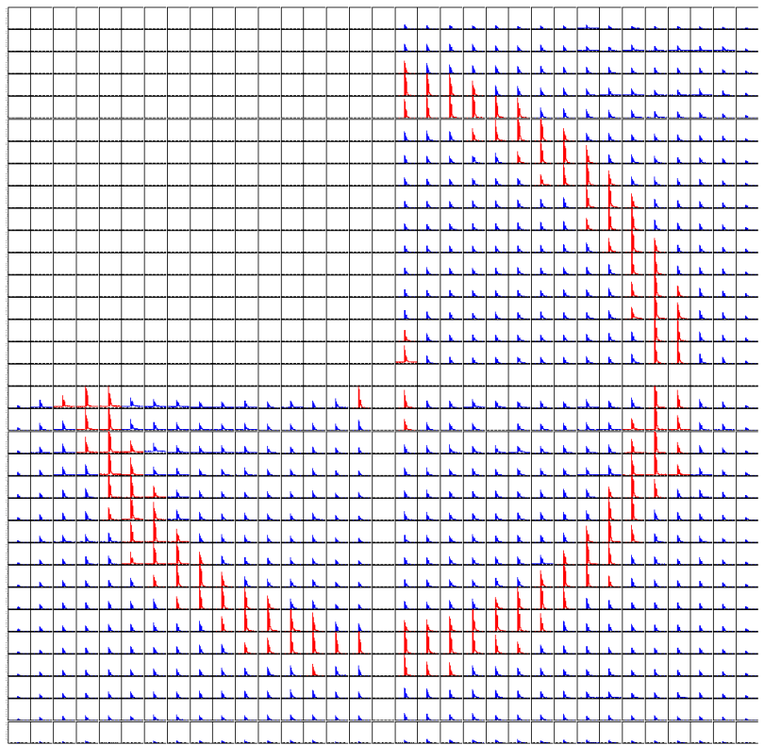
run 356

- **test pi/K separation**
- **no pid trigger**
- **no beam position**
- **tdc spectra is different from proton run**

MPPC Calibration Run

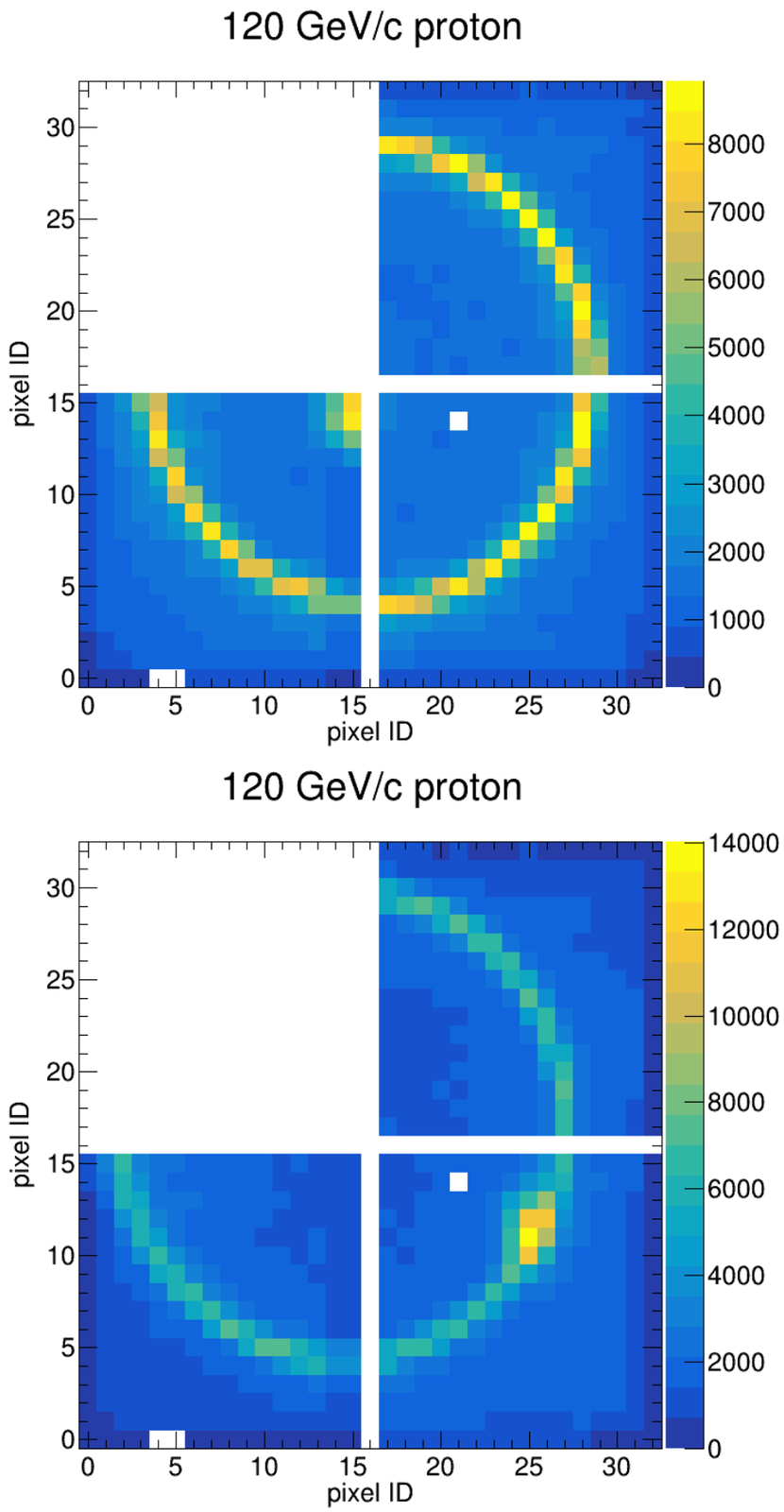


run 649

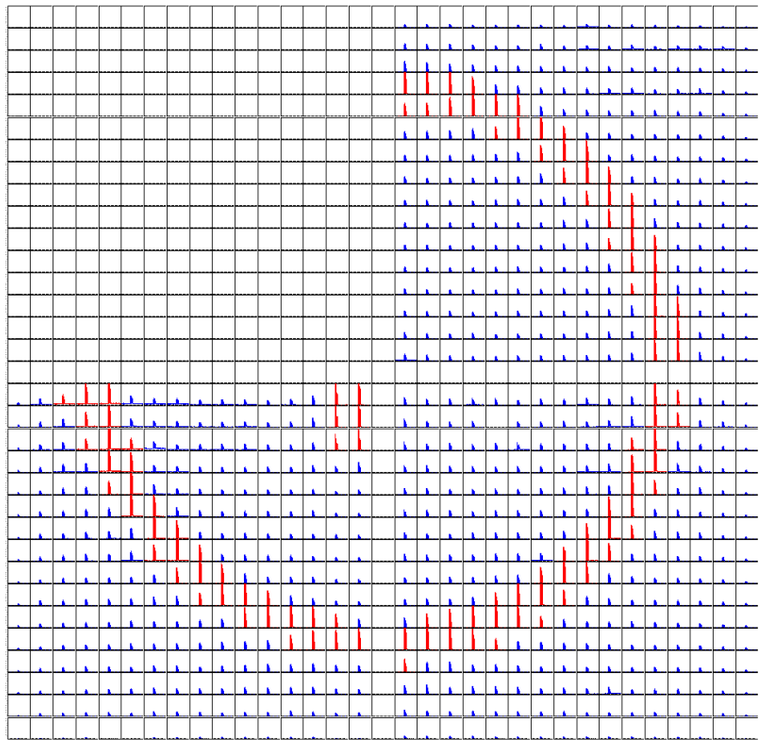


- **120 GeV/c proton & center**
- **-30o & BV 65V & threshold 50**
- **determine tdc cuts**

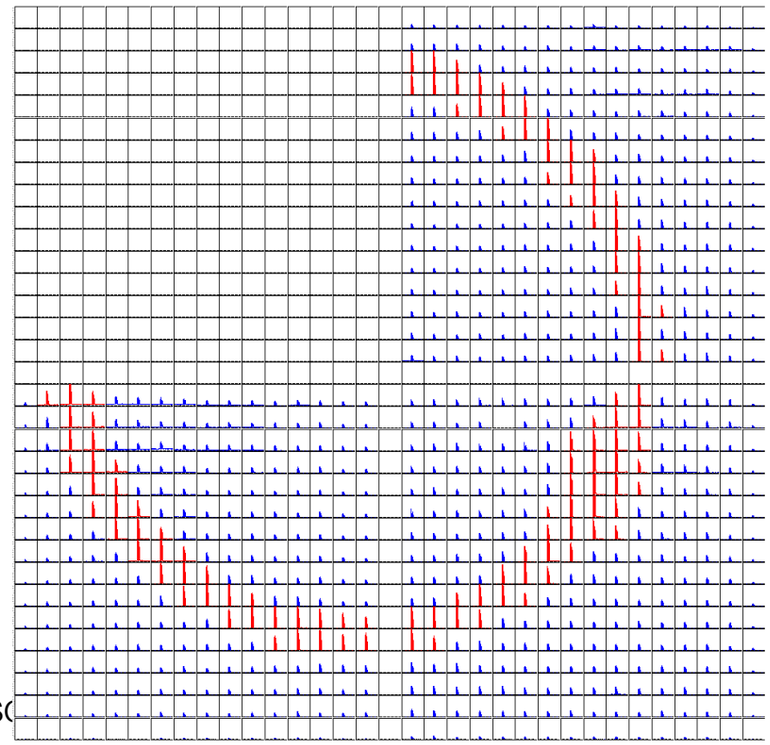
MPPC Position Scan



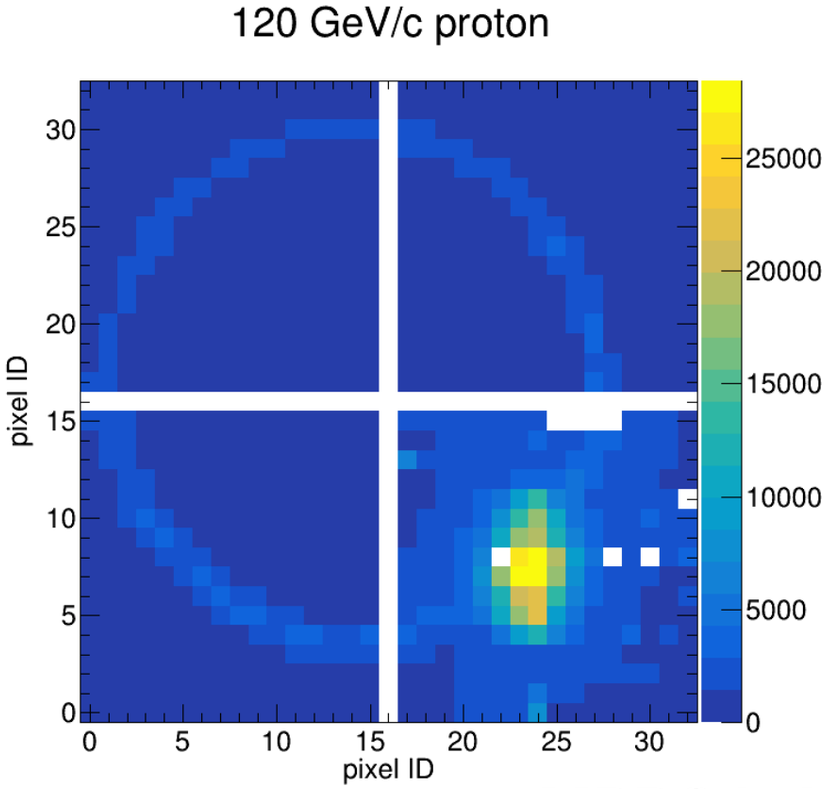
run 666



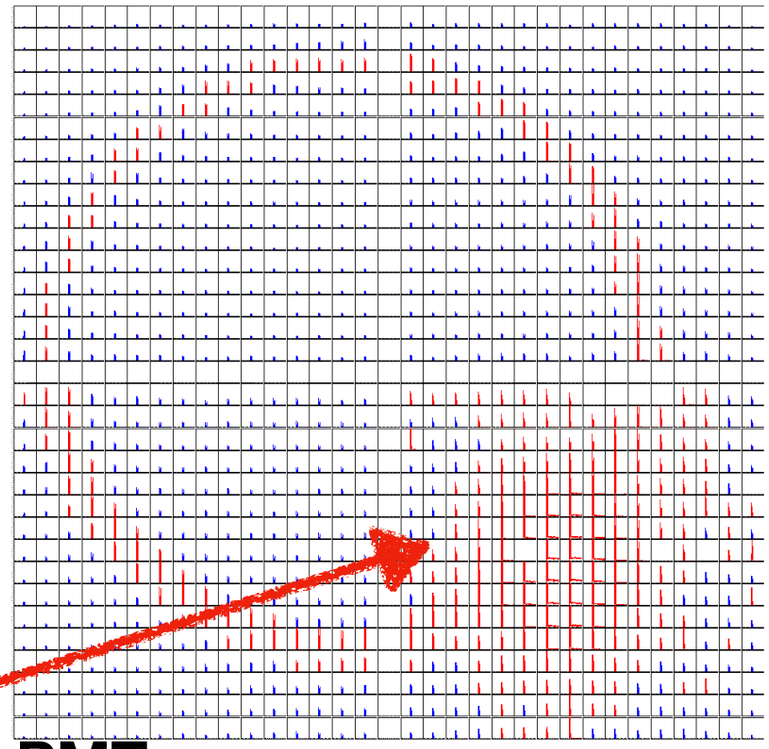
run 672



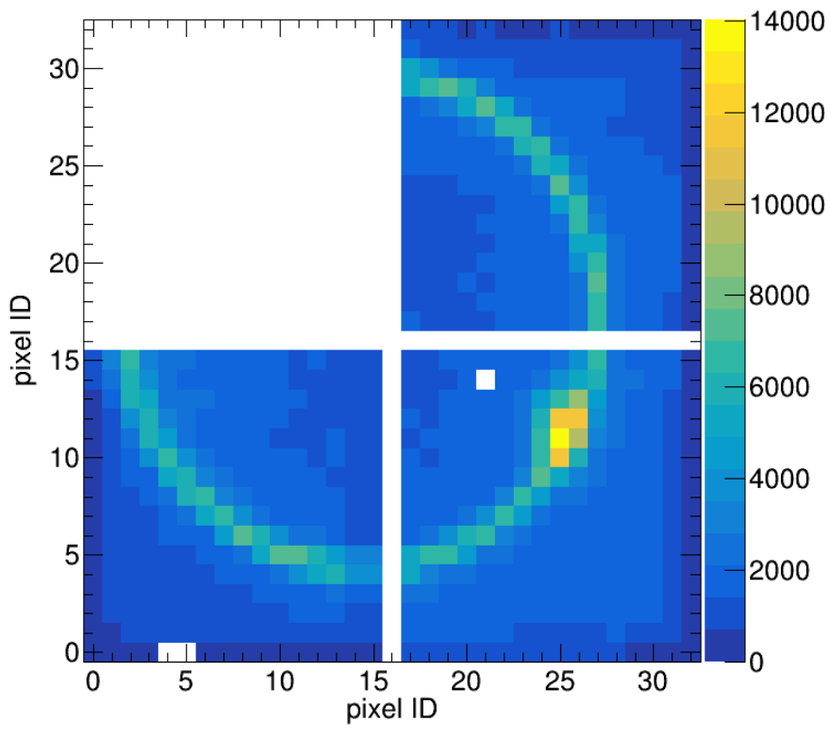
Beam Spot Comparison



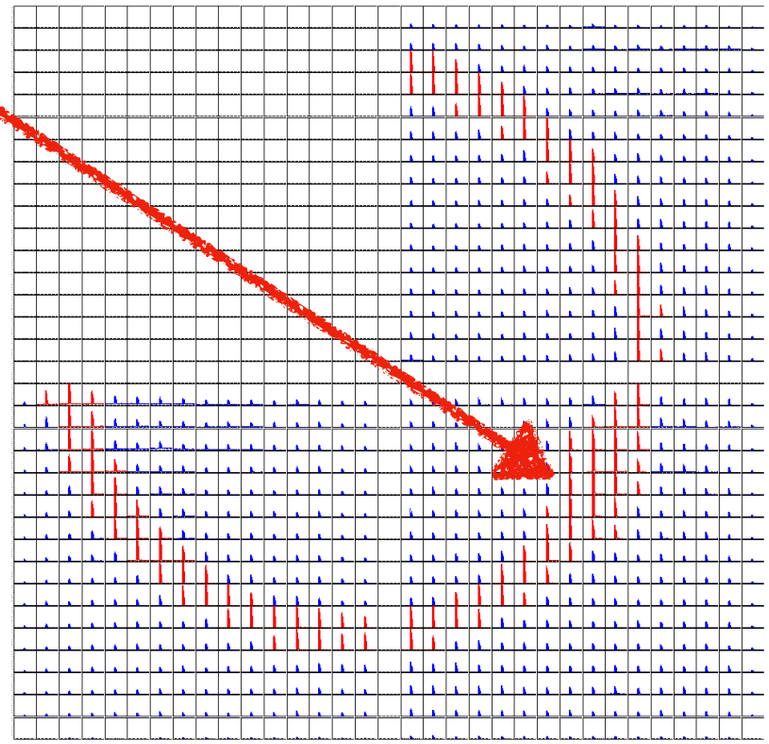
PMT
run124



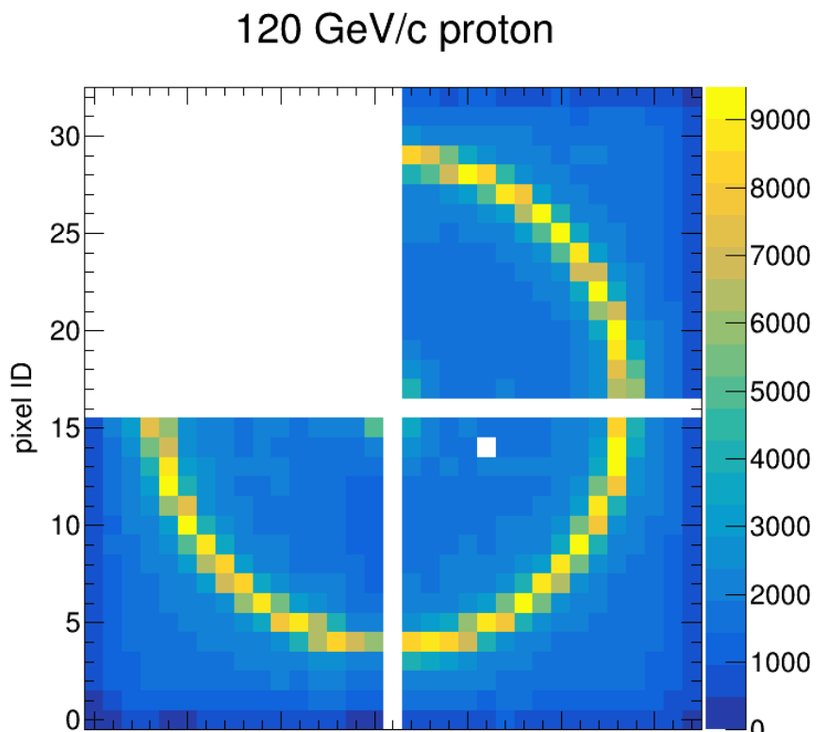
MPPC is less “shiny” than PMT

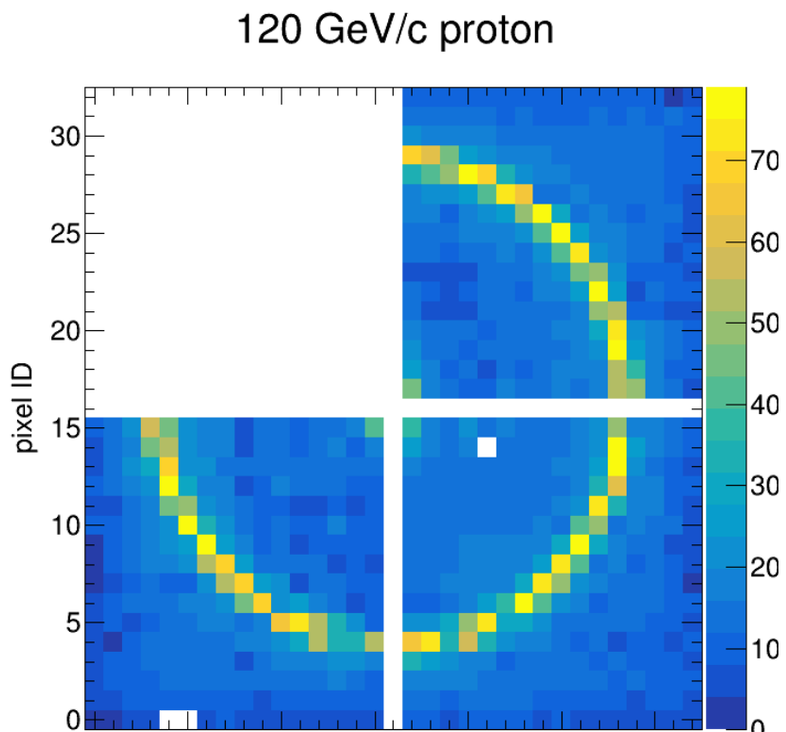


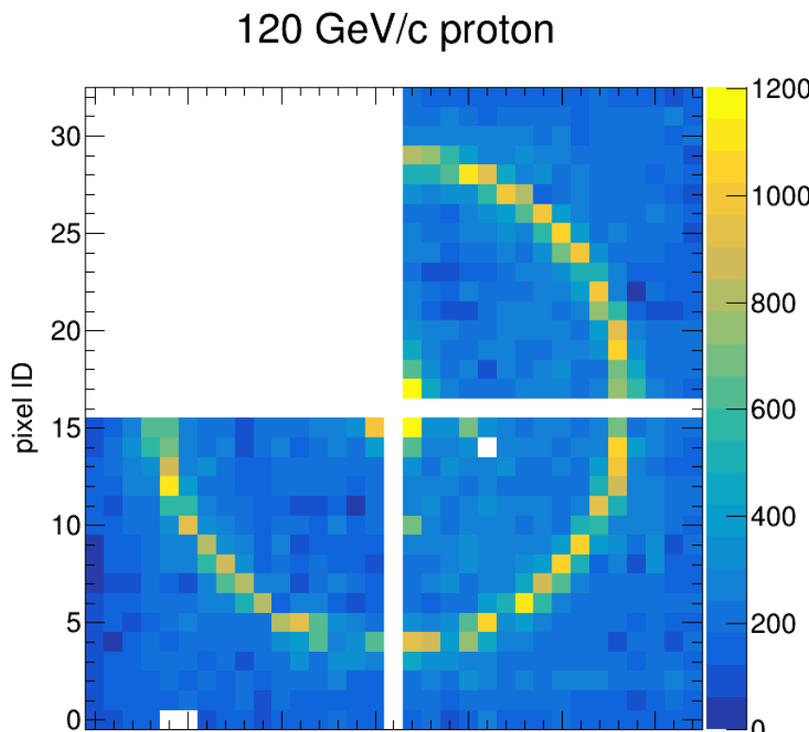
MPPC
run 672



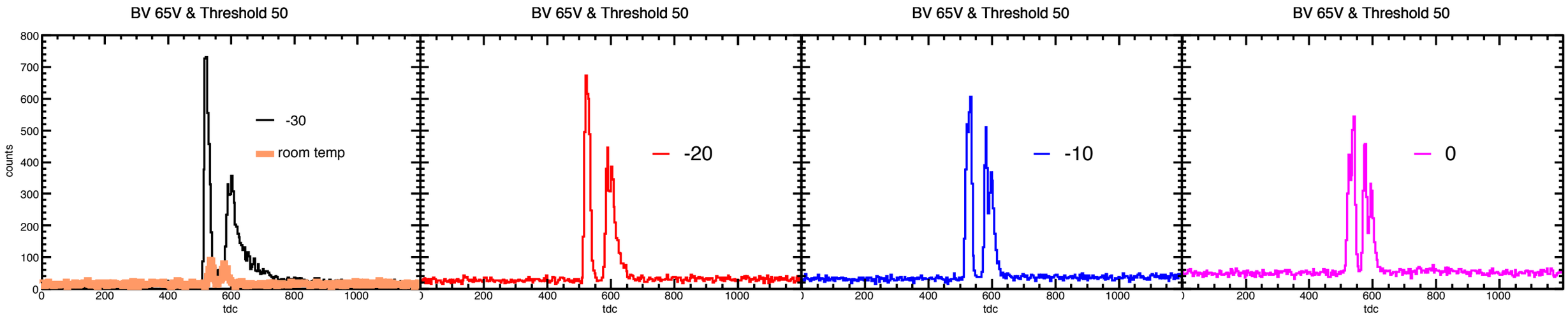
MPPC Temperature Scan



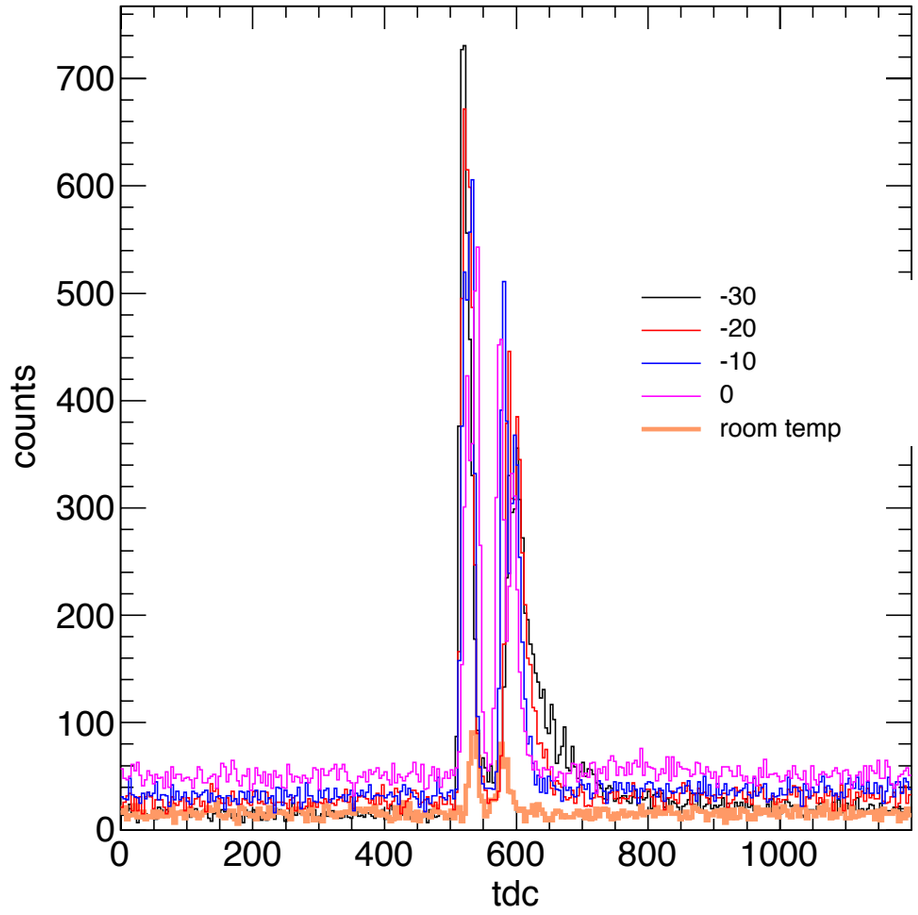




MPPC Temperature Scan

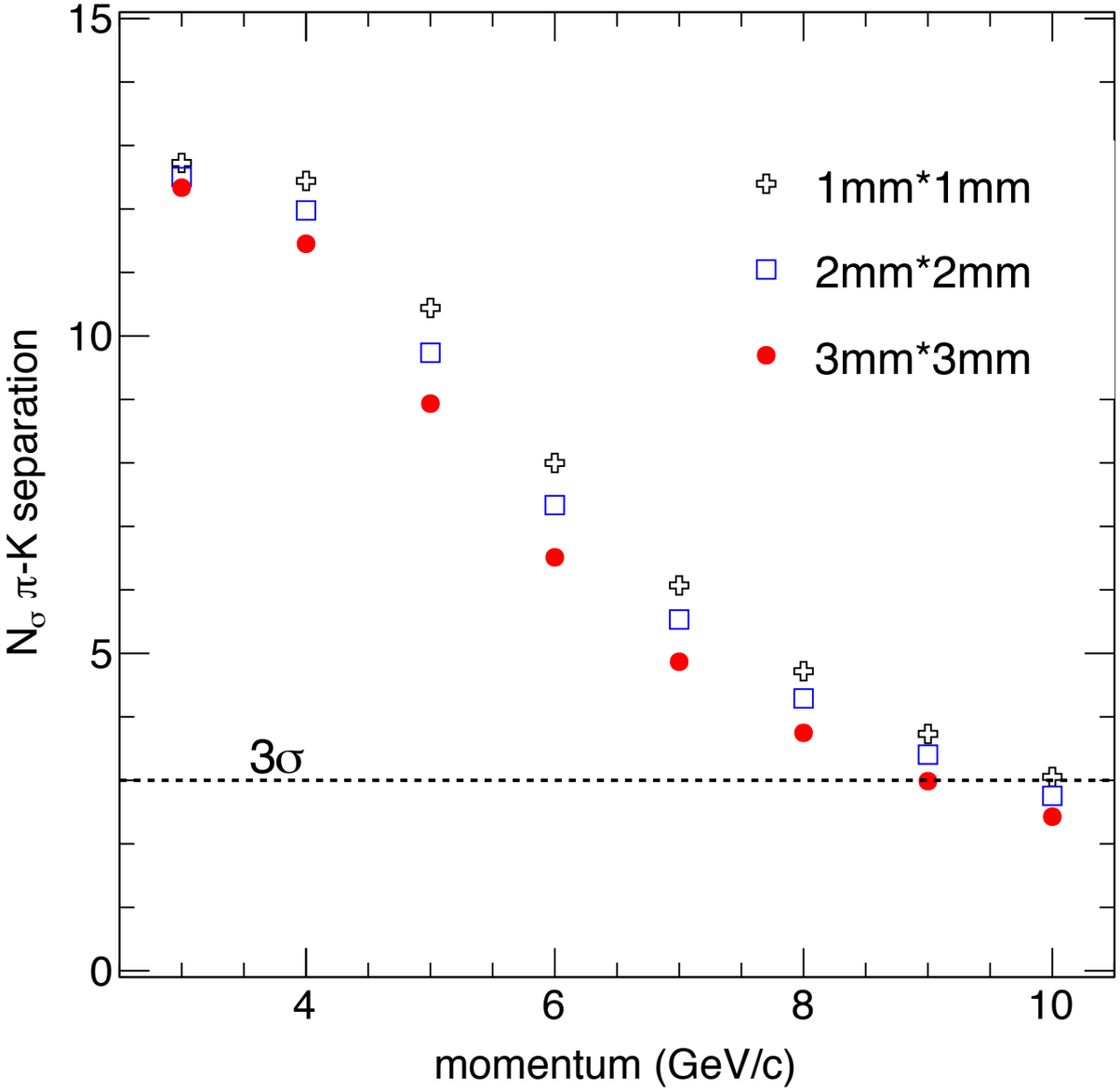


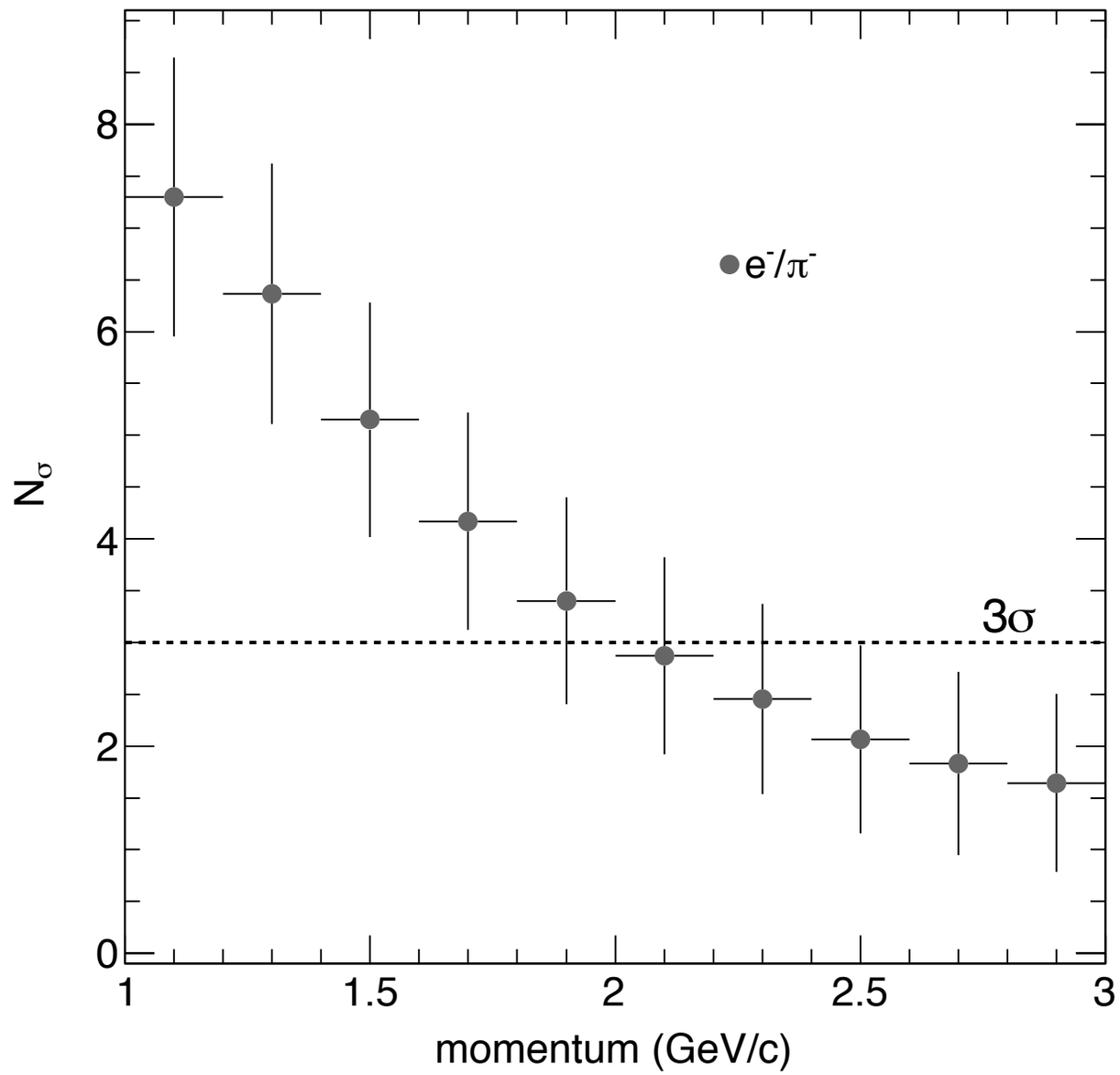
BV 65V & Threshold 50



- **noise level increase with temperature**
- **50K events for each run**
- **real events decrease with temperture**

Simulation Updates





- **pi/K separation up to 9 GeV/c**
- **e/pi separation up to 2 GeV/c**
- **errors are under investigation**

Summary and Outlook

- Basic QA for beam test data
- Finishing QA note
- Event-by-event analysis and simulation update are on the way
- Working on analysis note

Thanks for your attention!