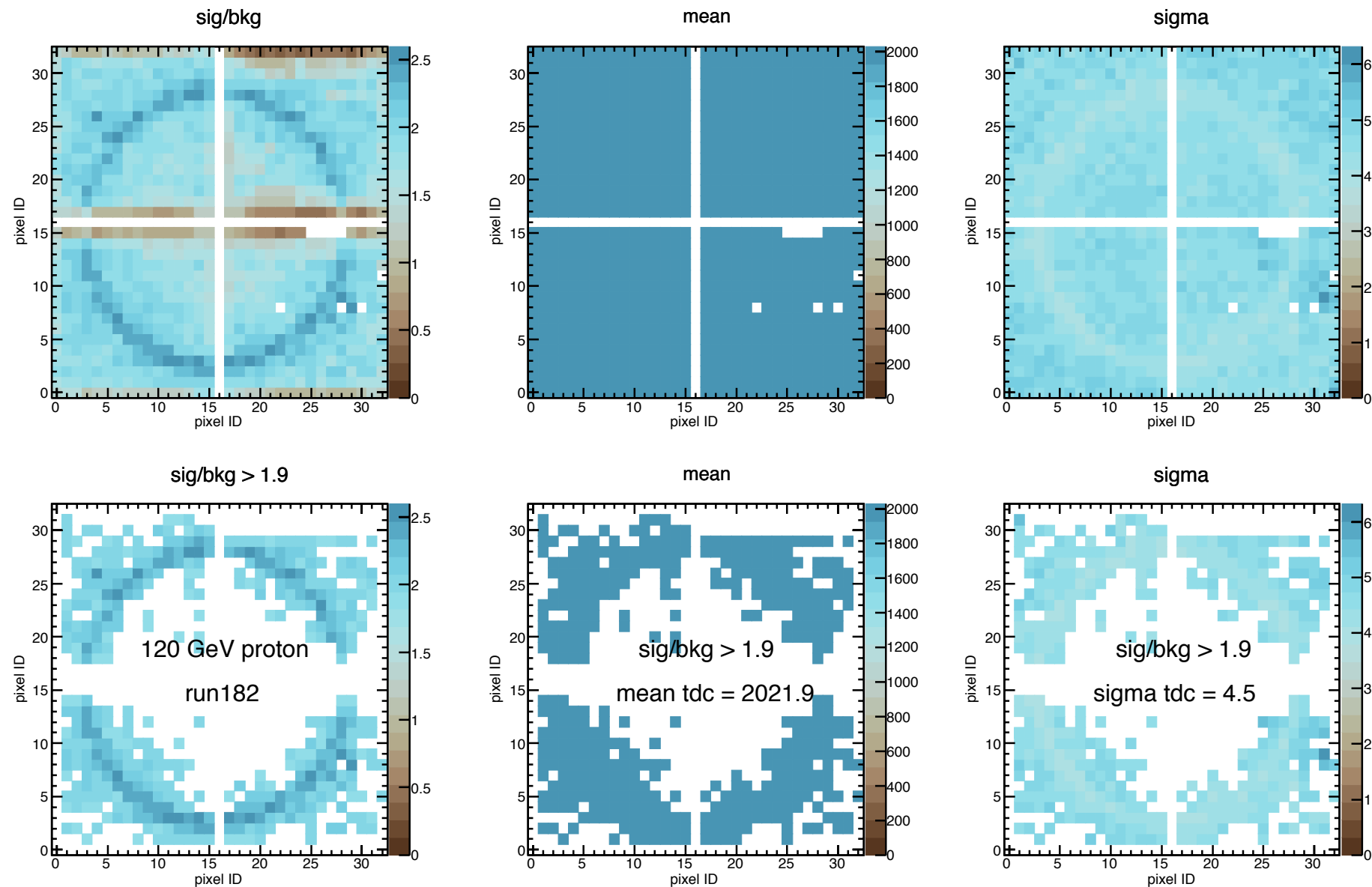




# Test Beam Analysis Update

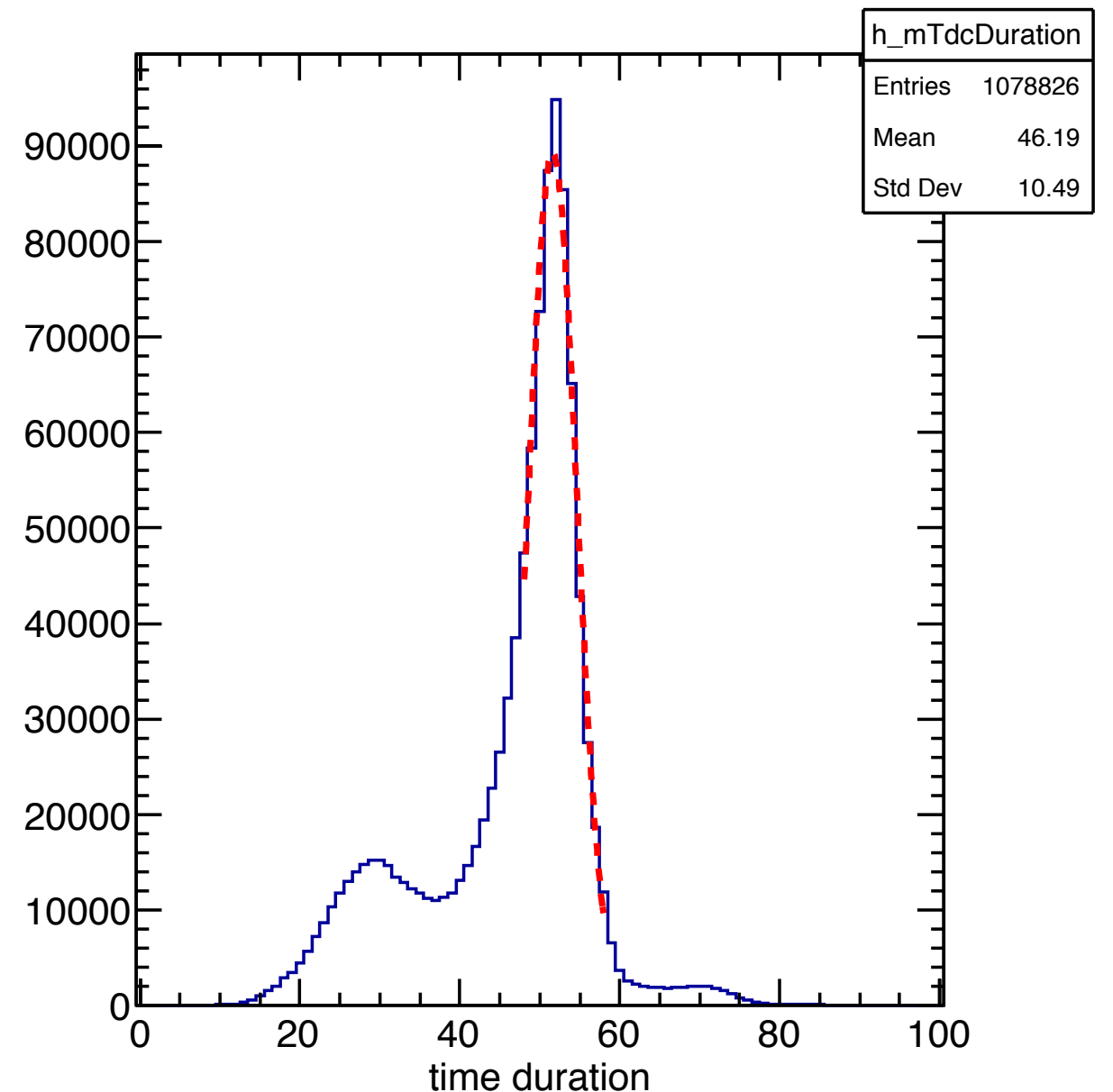
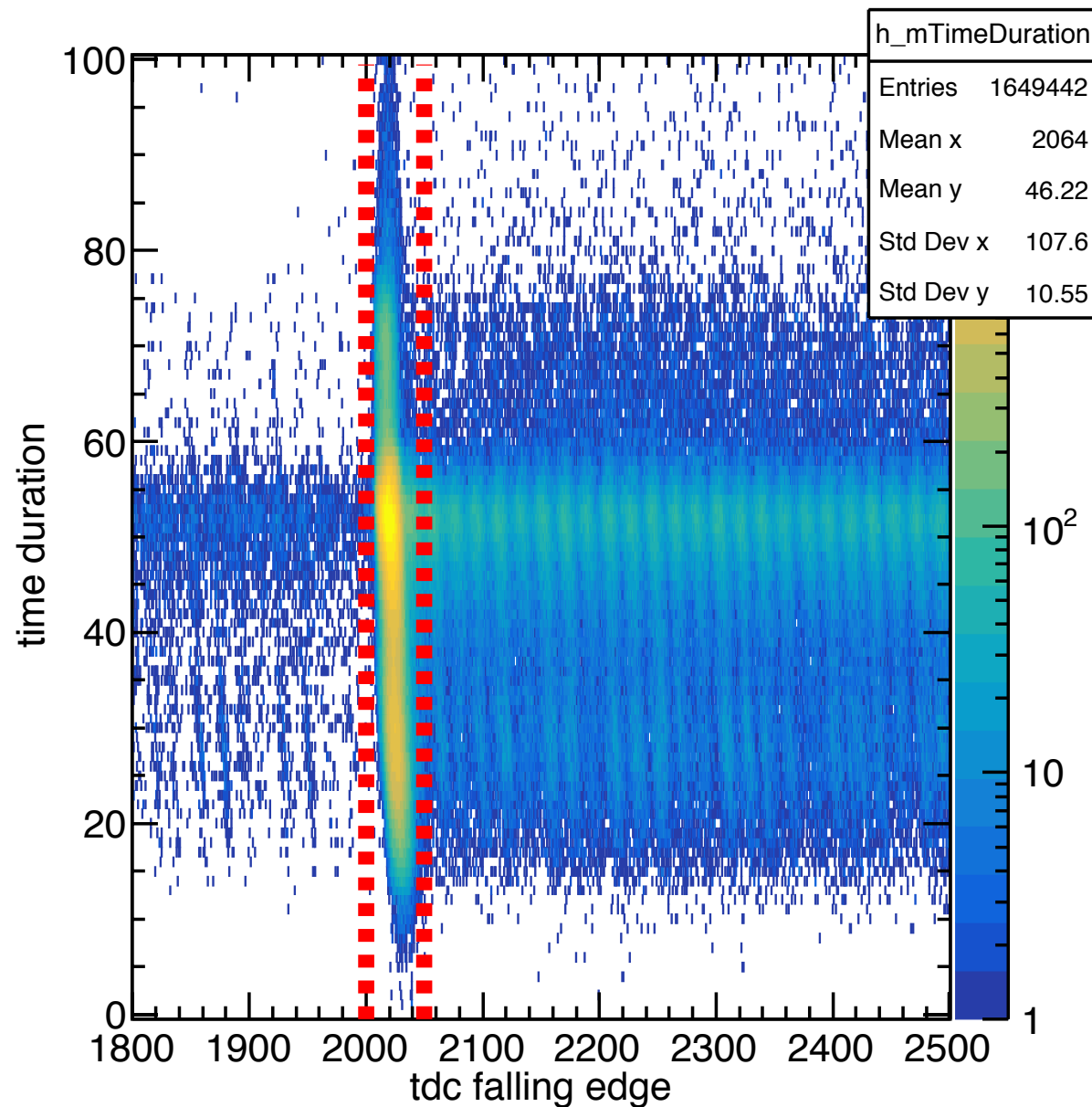
**Xu Sun**

# TDC Cut for PMTs



- save mean & sigma of tdc
- tdc cuts set to 2 sigma

# Time Duration Cut for PMTs

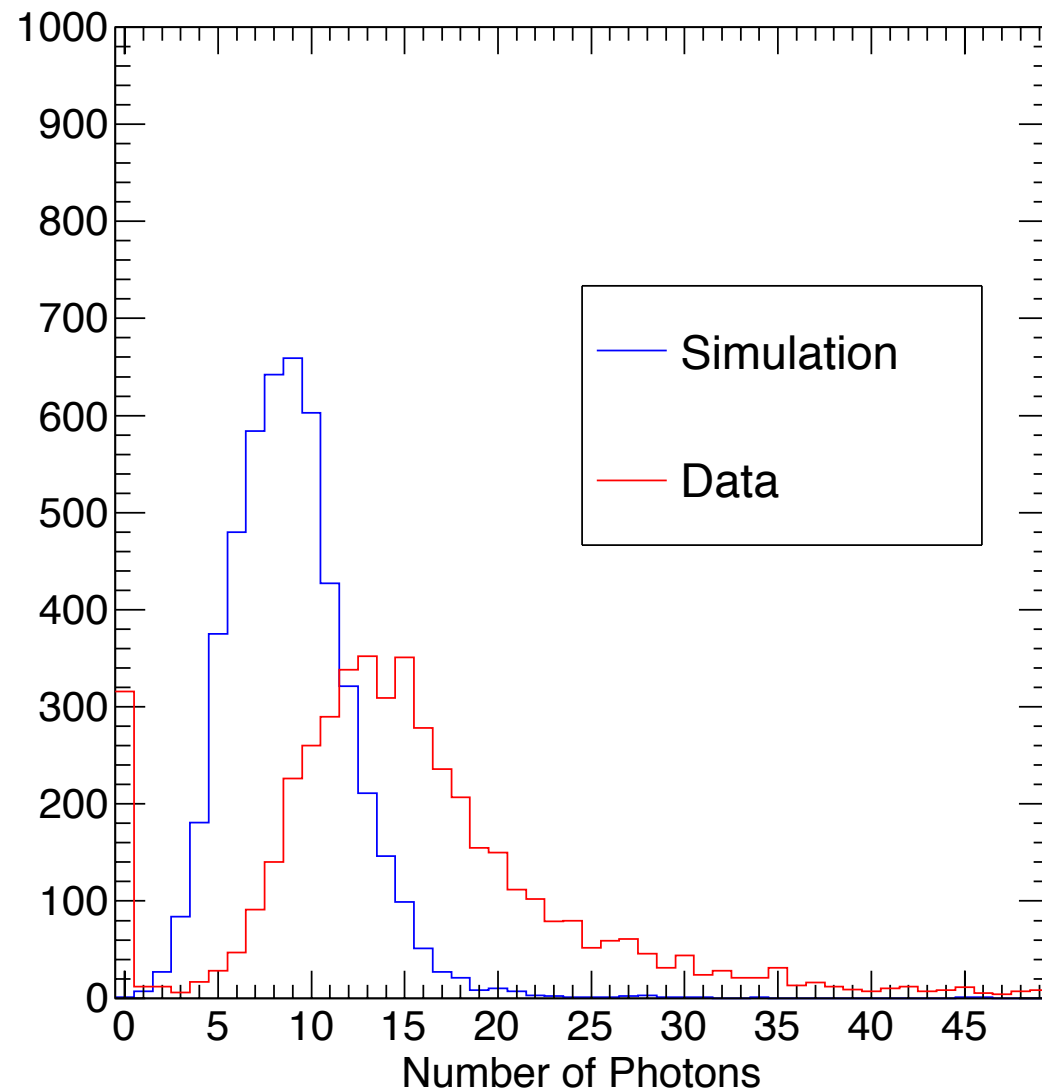


- $\text{time} = \text{tdc\_falling} - \text{tdc\_raising}$
- projection range is under investigation
- 2 sigma cut applied to test beam data

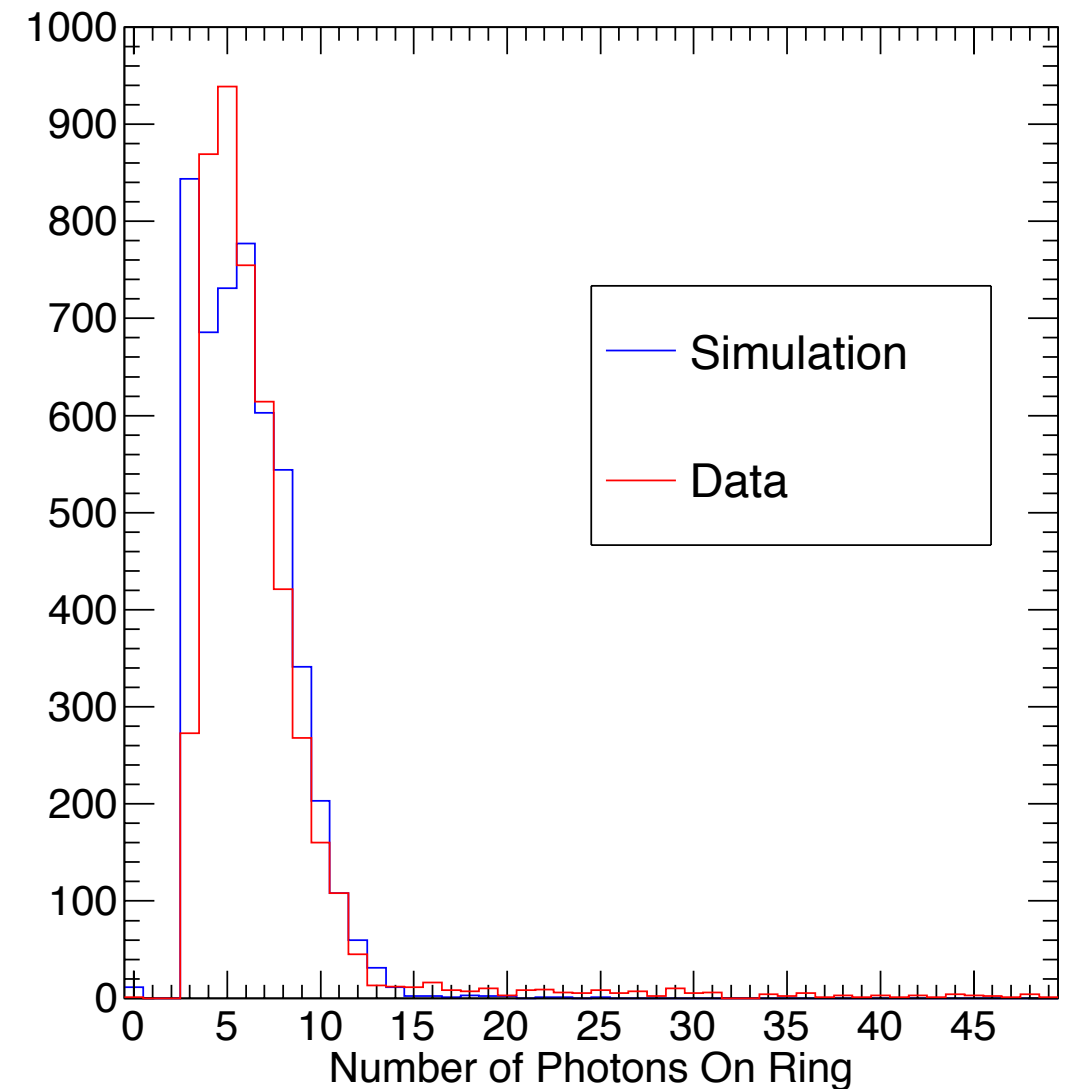
# Number of Photons with Old Cuts



**total number of photons**



**number of photons on ring**

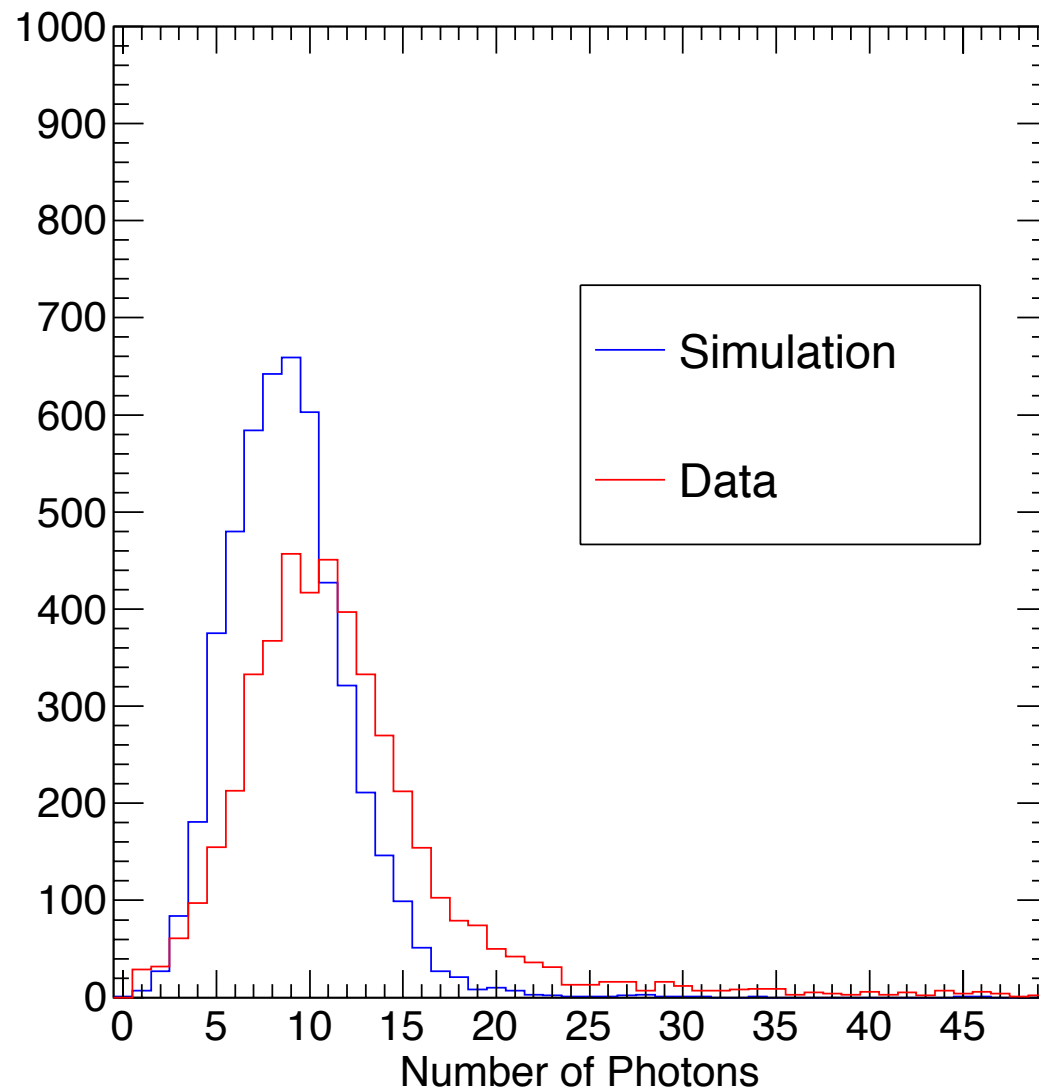


- **data shows more total photons**
- **photons on ring matched with simulation**
- **more photons from noise?**

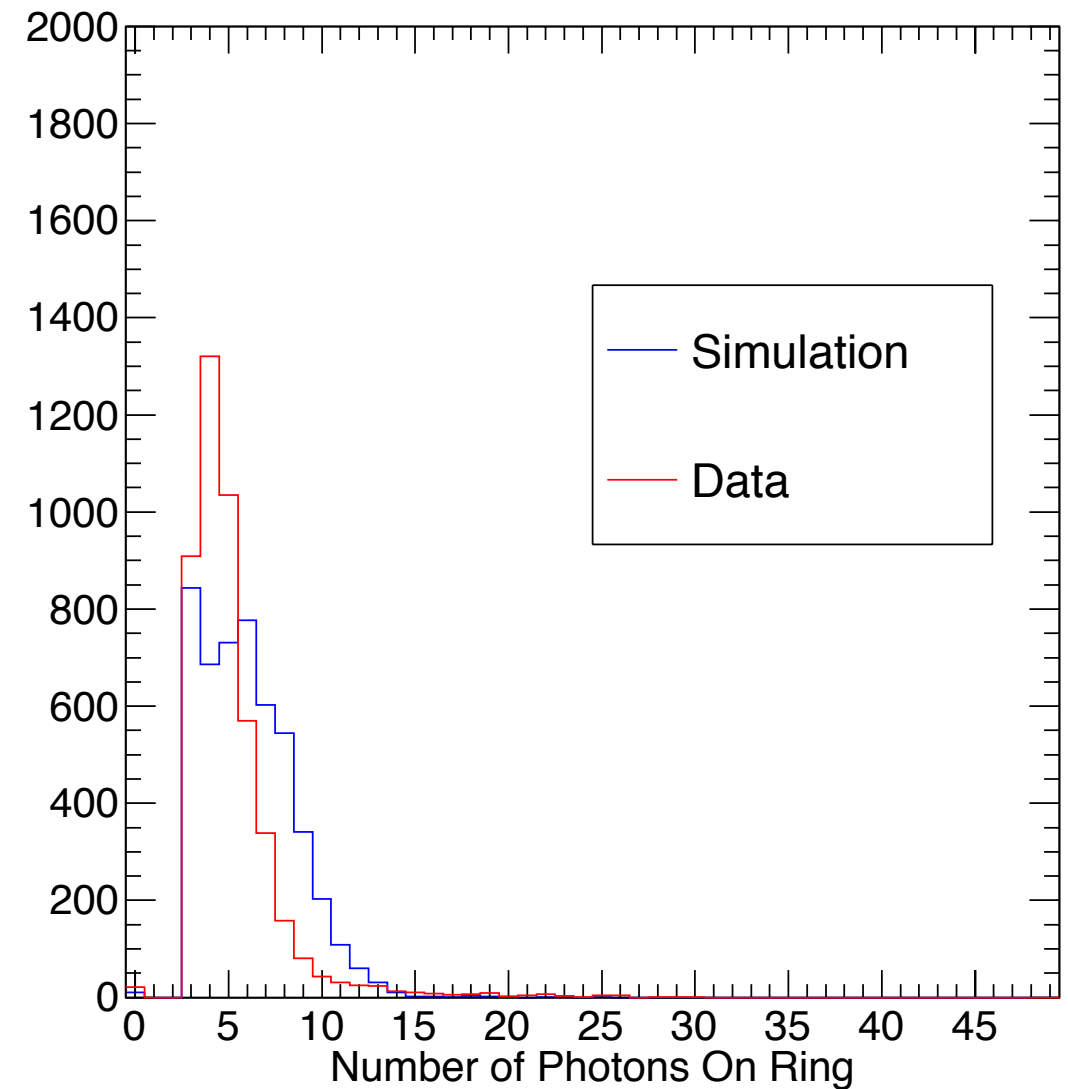
# Number of Photons with New Cuts



total number of photons



number of photons on ring



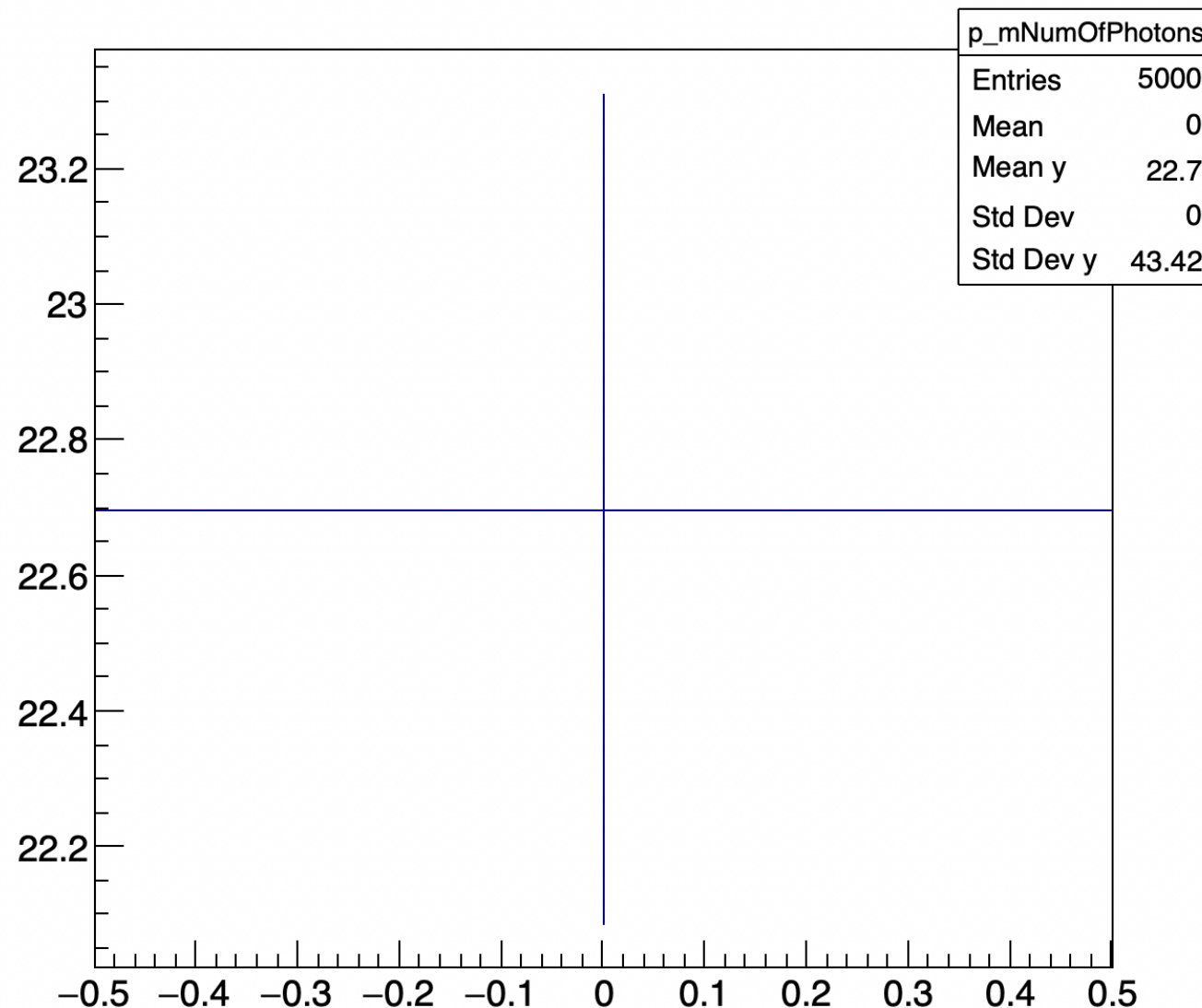
- Number of photons reduced in data
- Number of photons on ring seems off

# Number of Photons Comparison



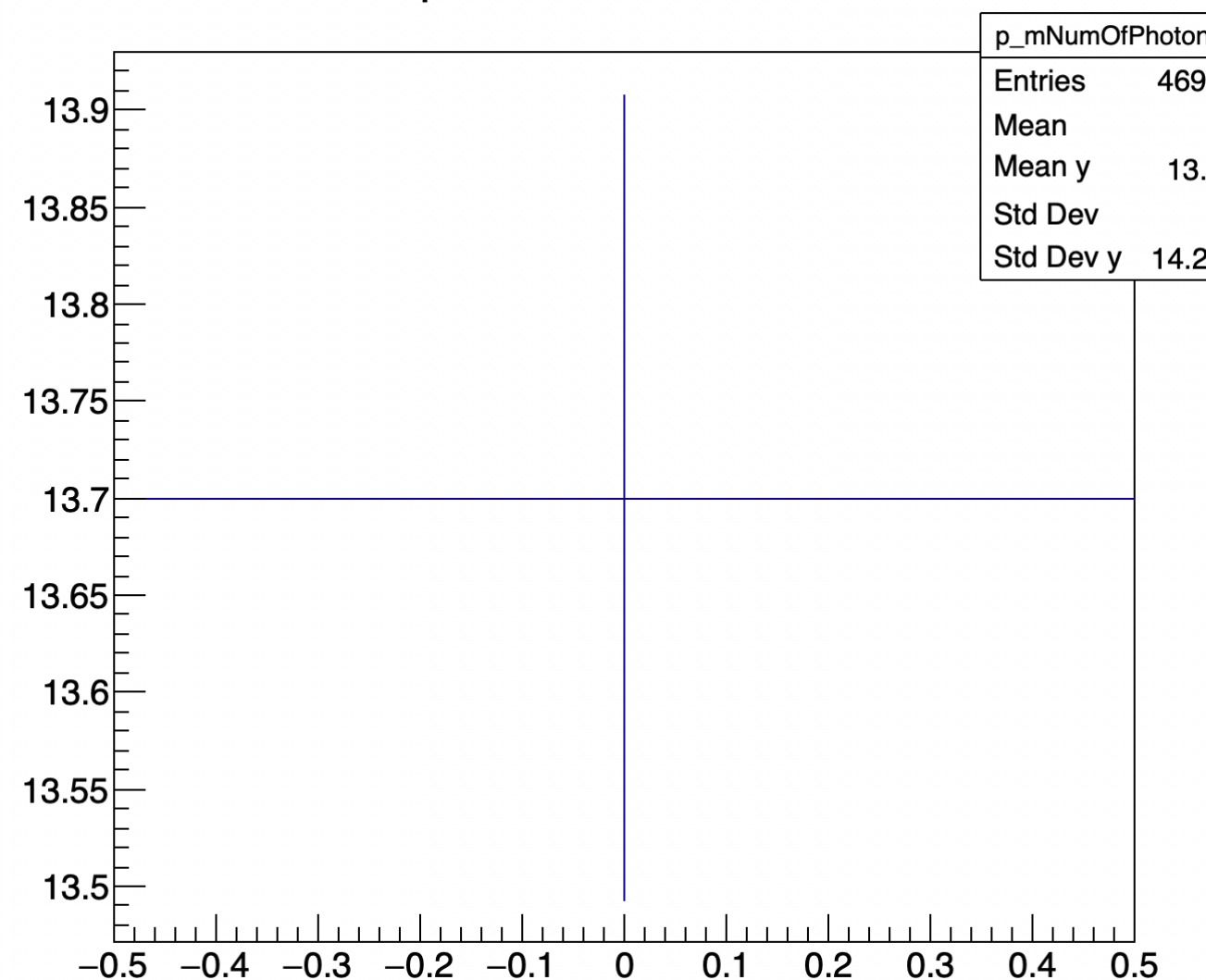
old cuts

p\_mNumOfPhotons



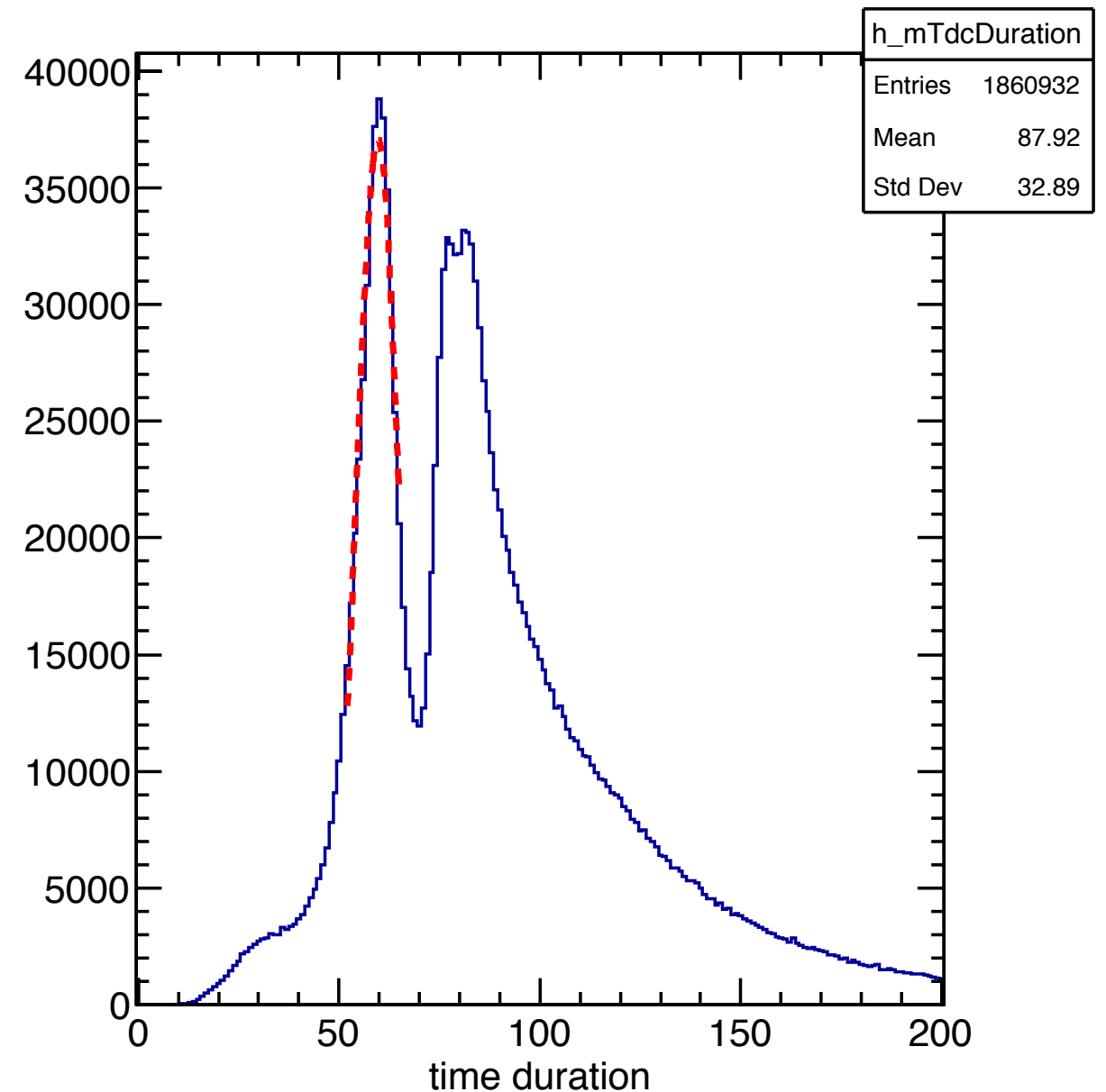
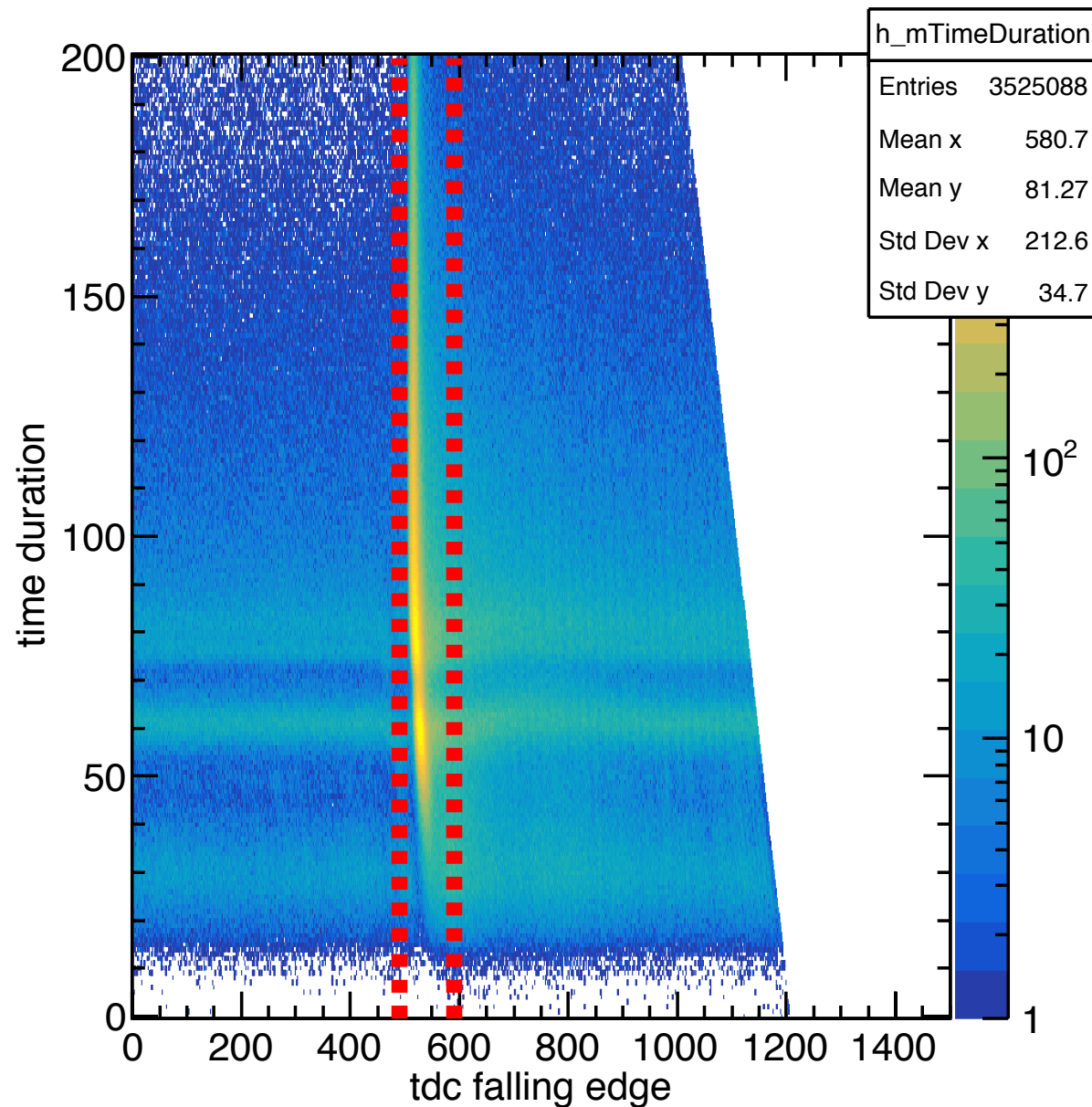
new cuts

p\_mNumOfPhotons



- 2 sigma tdc cuts => 22.7 photons
- 2 sigma tdc & time cuts => 13.7 photons

# Time Duration Cut for SiPMs

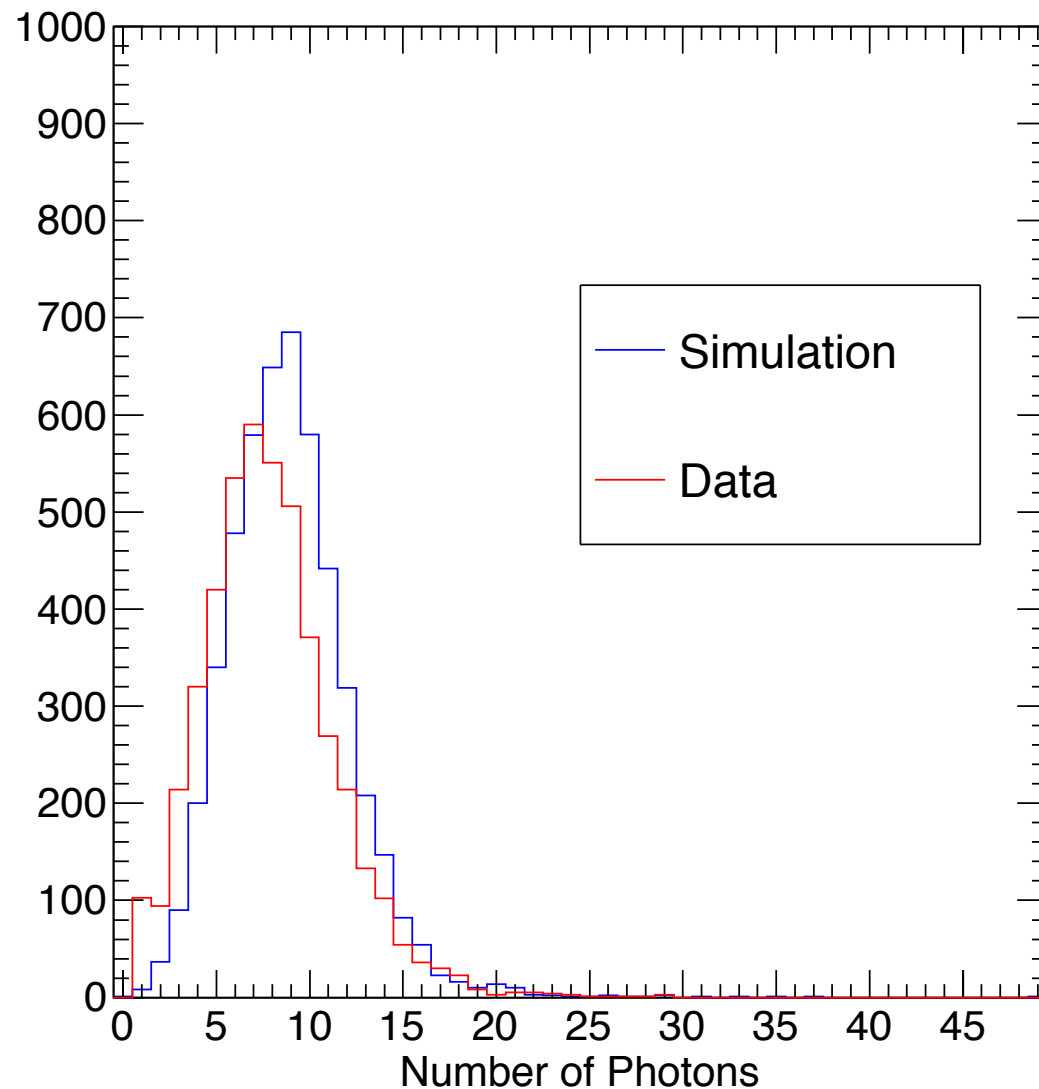


- $\text{time} = \text{tdc\_falling} - \text{tdc\_raising}$
- projection range is under investigation
- 2 sigma cut applied to test beam data

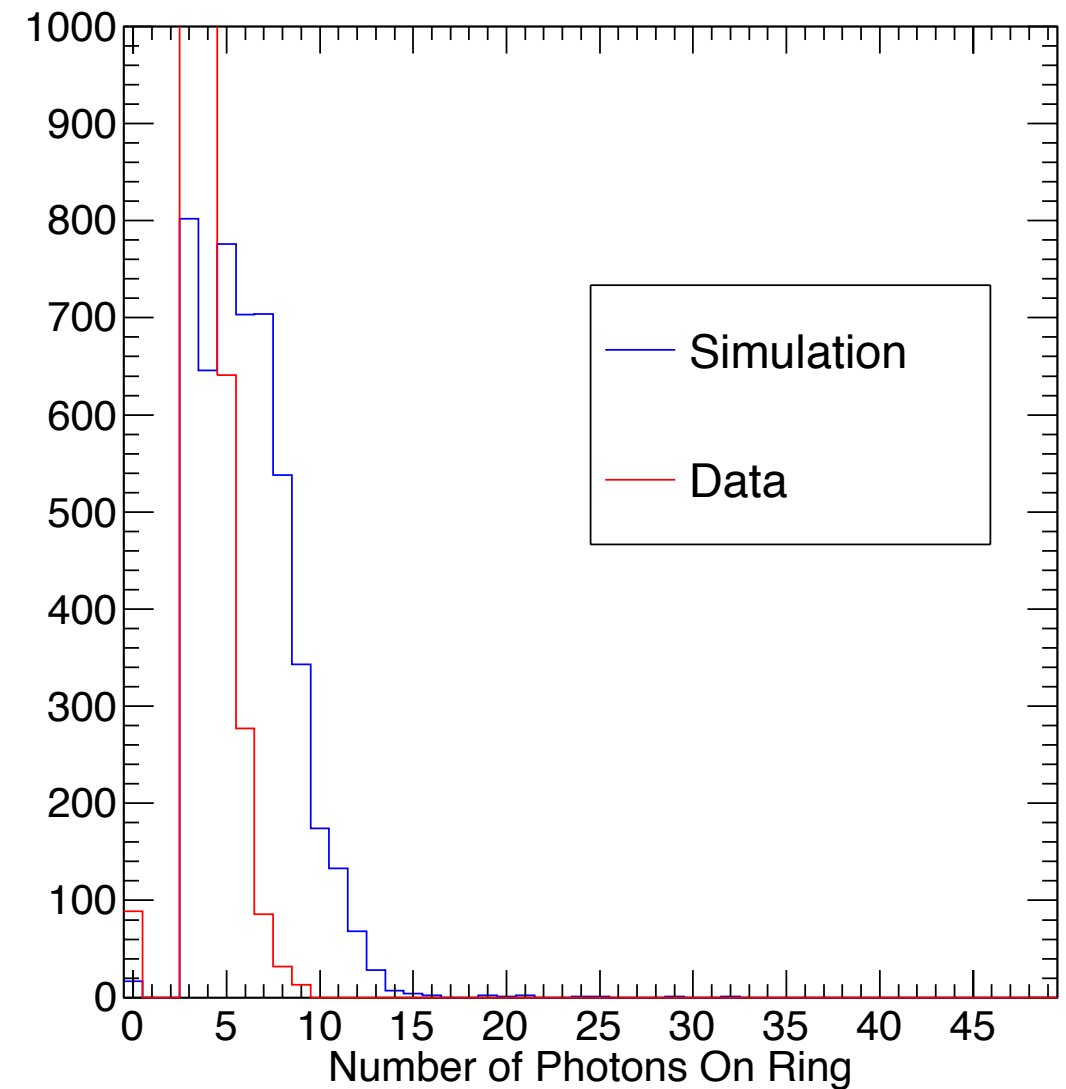
# Number of Photons with New Cuts



total number of photons



number of photons on ring



- number of photons is less in data => only 3 sipm arrays

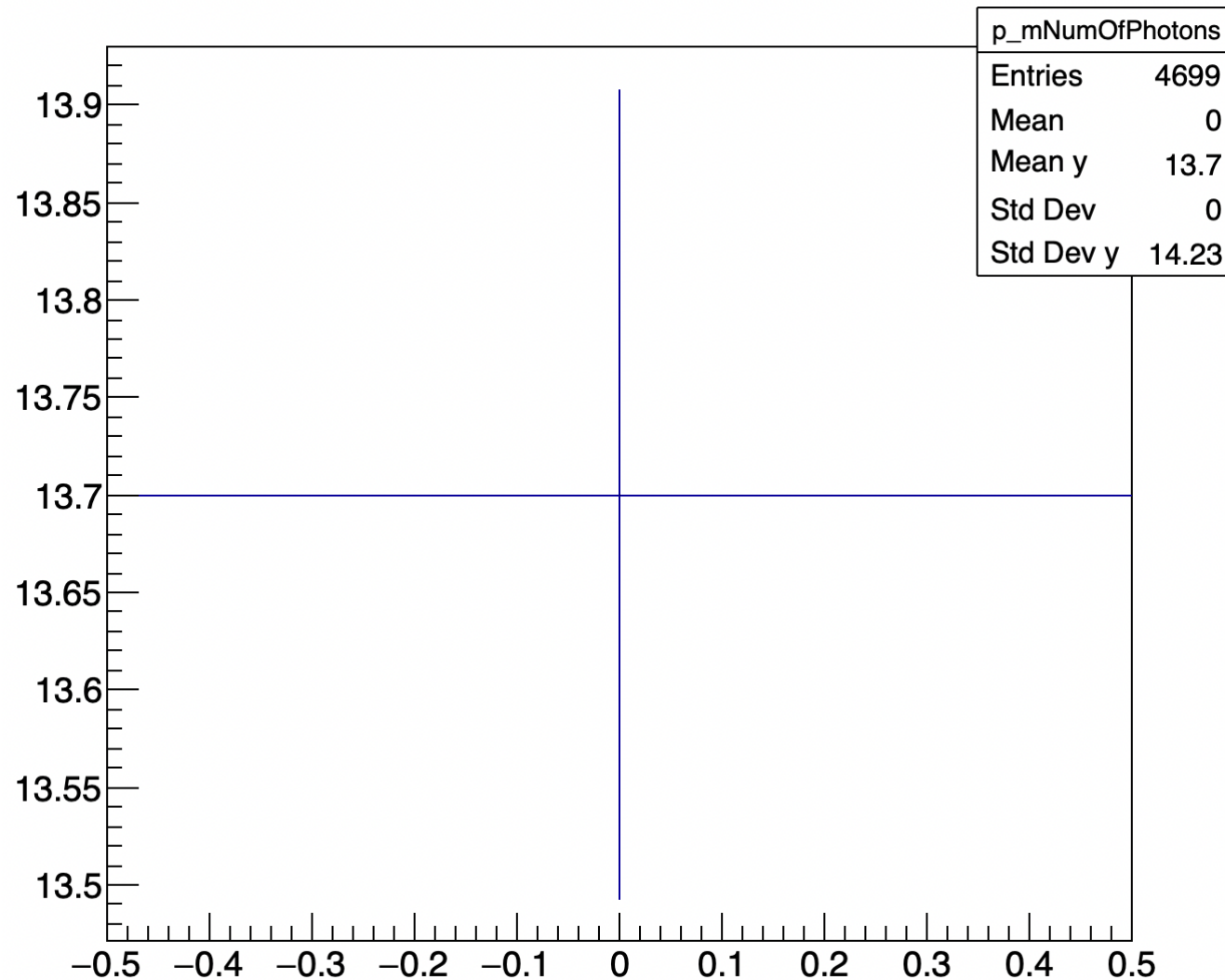
# Number of Photons Comparison



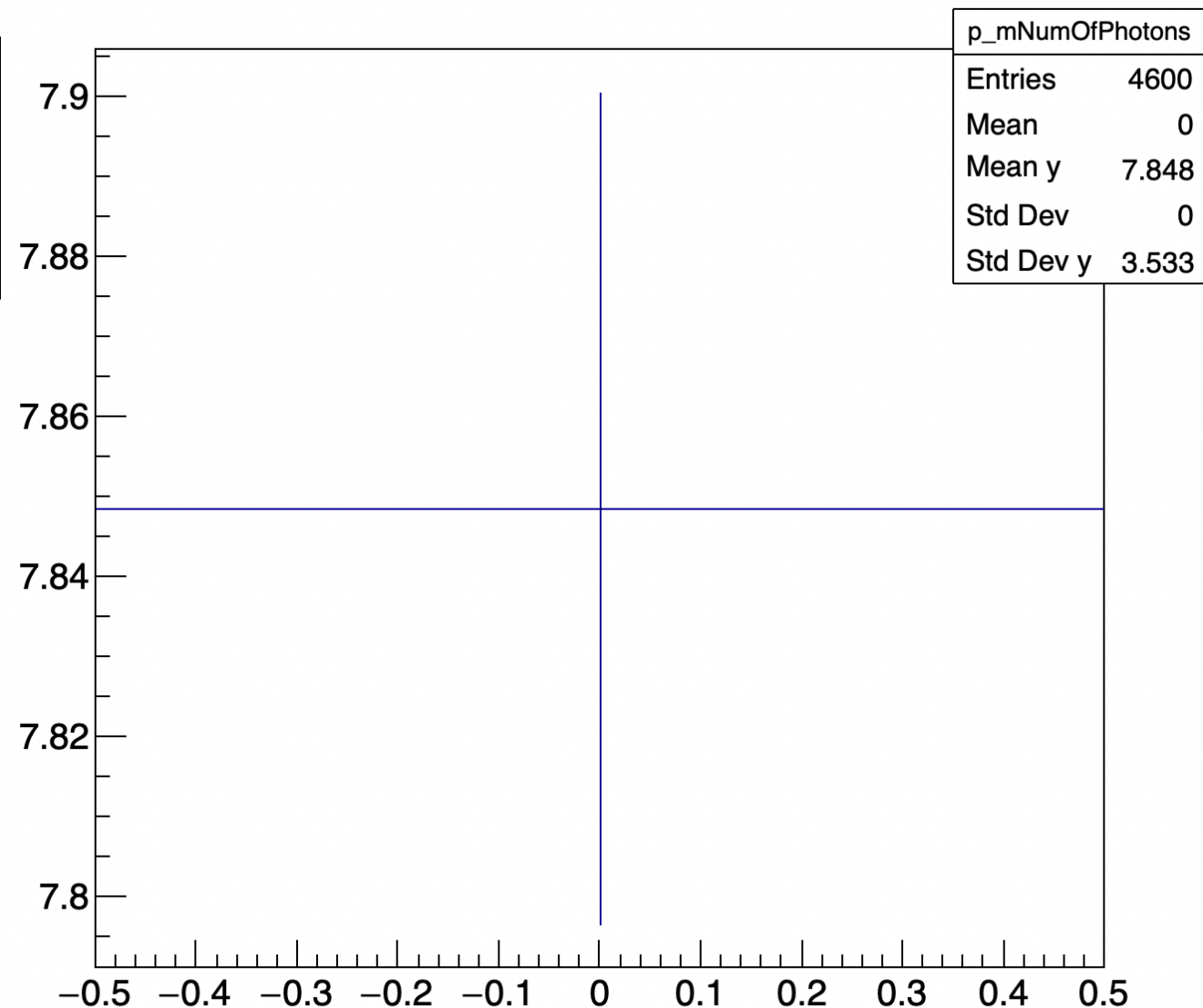
PMTs

SiPMs

p\_mNumOfPhotons



p\_mNumOfPhotons



- 1st test beam data:  $11.0 \pm 2.9$
- 2nd test beam with PMTs:  $\sim 13.7$
- 2nd test beam with SiPMs:  $\sim 7.8$  ( $10.4 \times 0.75$ )

# Summary and Outlook



- data and simulation get closer to each other
- sipm shows better agreement with simulation
- will identify time duration of beam spot for meson beam analysis
- simulation need to be updated with noise