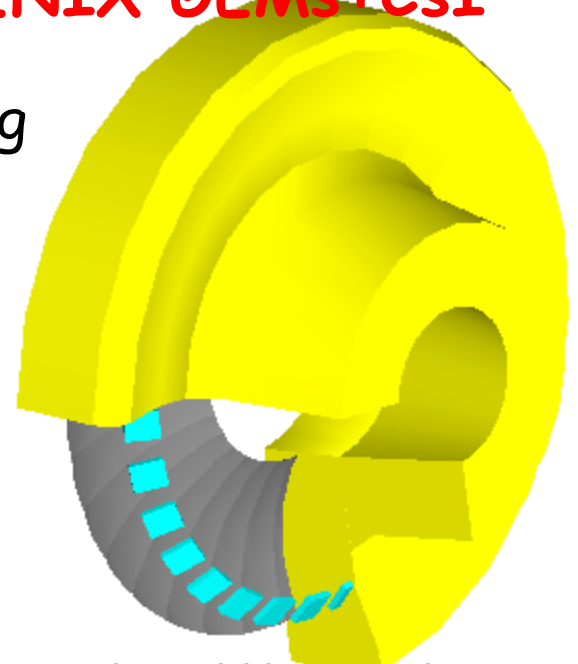
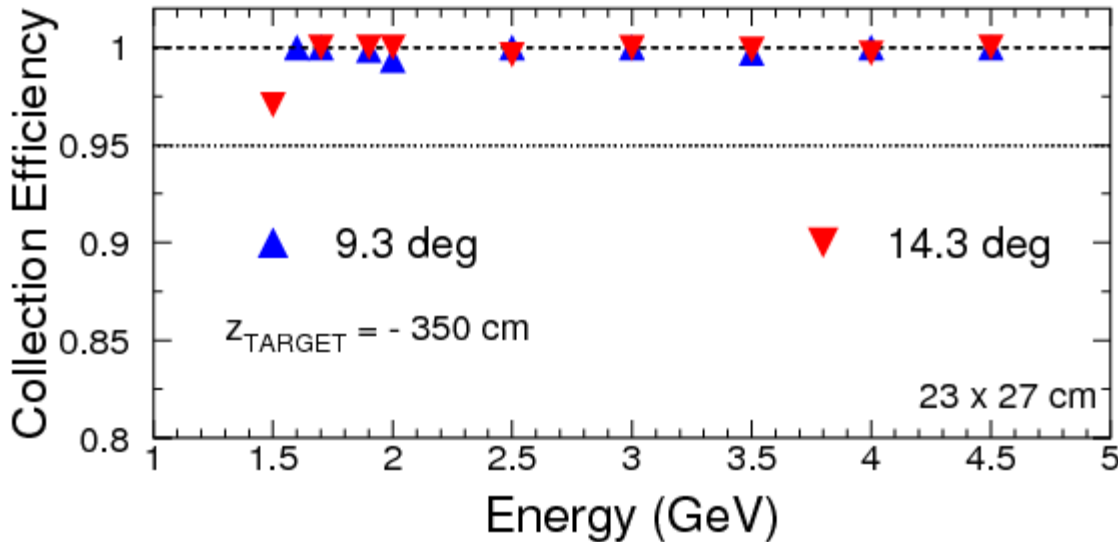
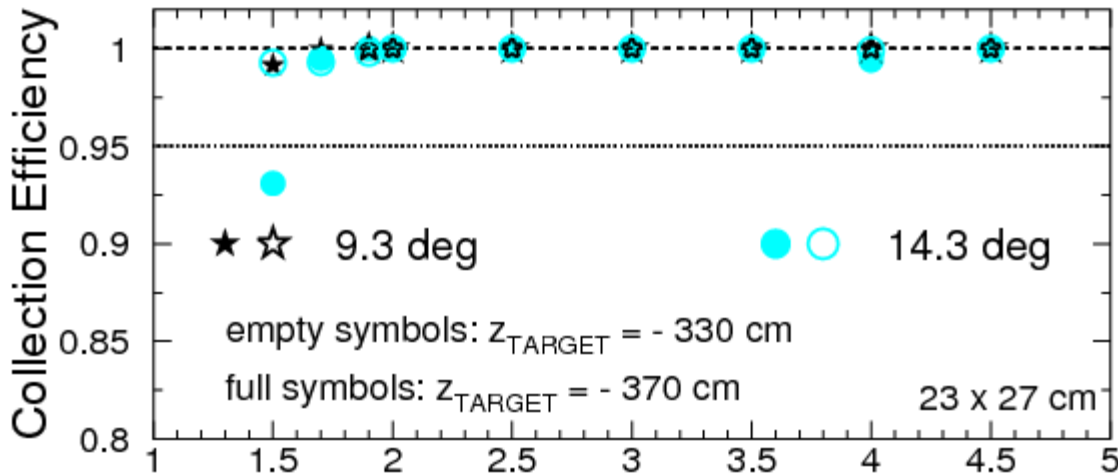


SoLID Cherenkov Update  
September 12, 2011

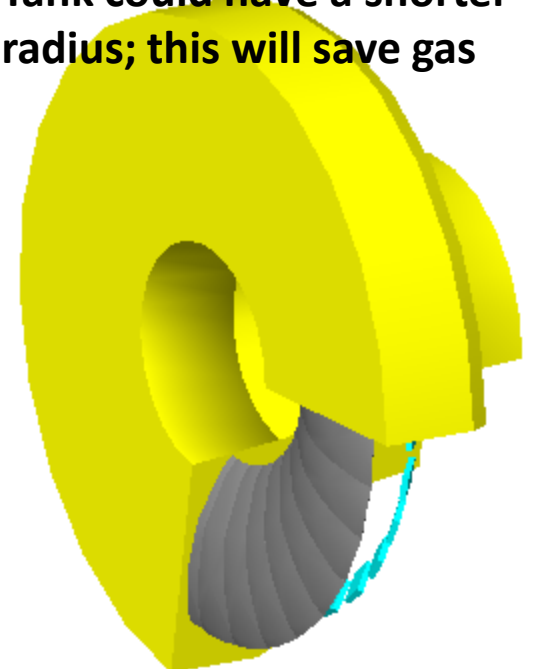
Simona Malace (Duke U.)

# SIDIS Light-Gas: PVDIS mirror + PHENIX GEMs+CsI

CLEO final design not ready yet: I am looking at details with the BaBar configuration

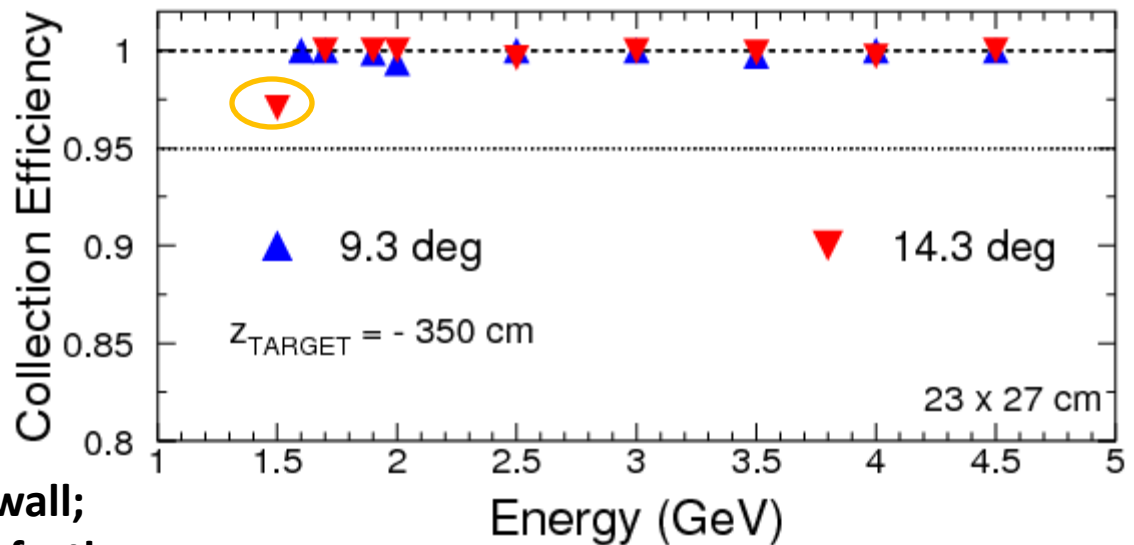
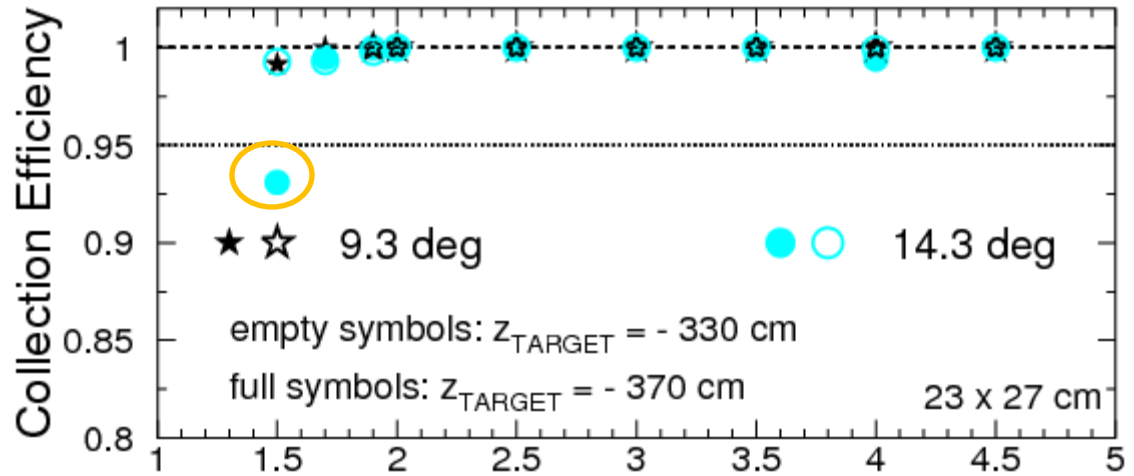
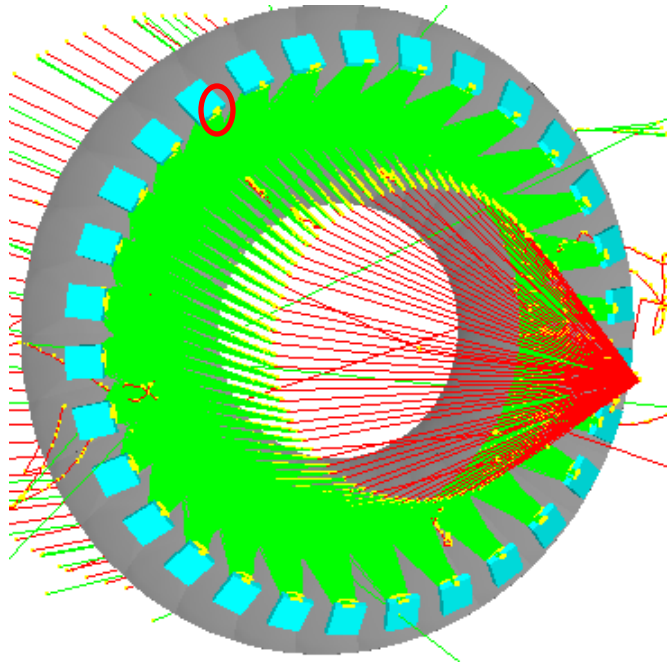


**Tank could have a shorter radius; this will save gas**



# SIDIS Light-Gas: PVDIS mirror + PHENIX GEMs+CsI

Optimization for high polar angle



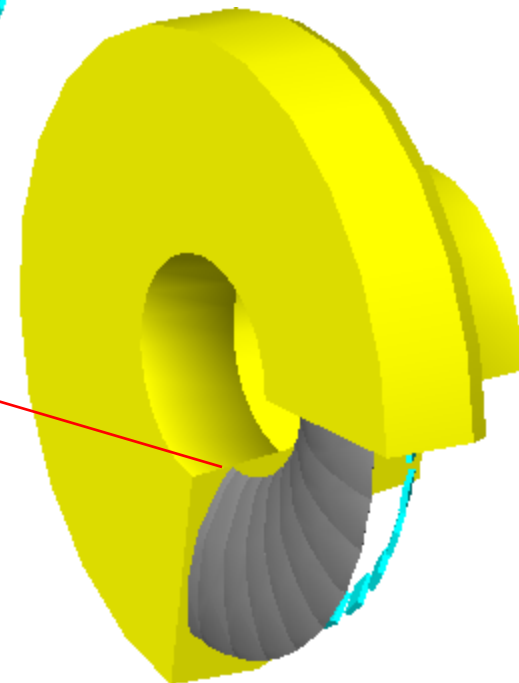
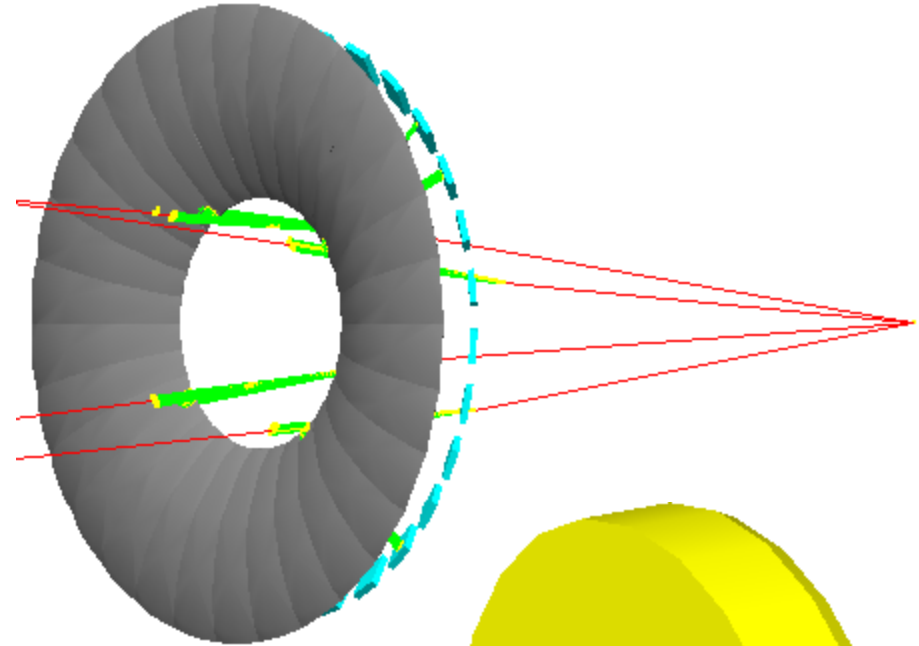
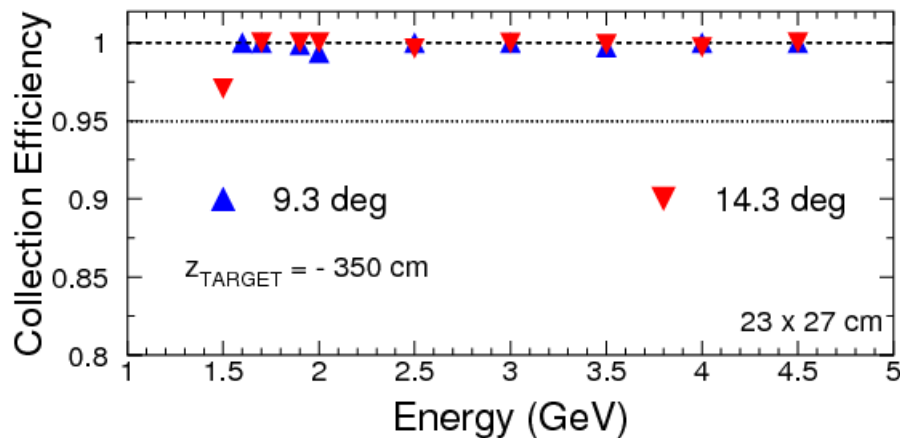
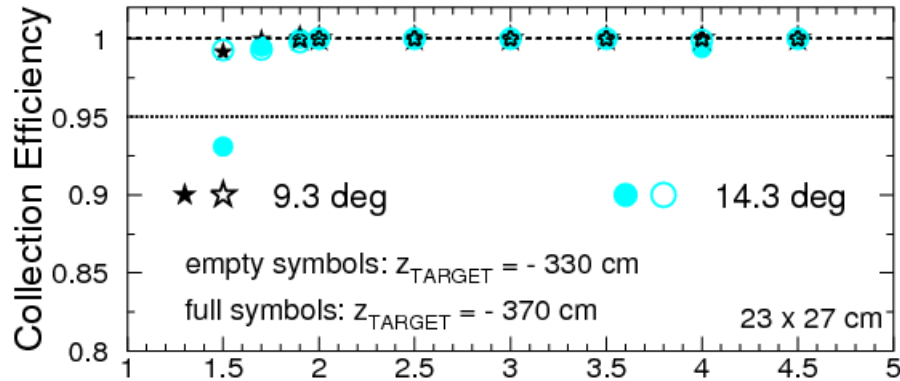
Close to the tank wall;  
cannot be pushed further  
upstream & toward  
beamline

Very good collection efficiency: sharing  
the mirrors + PHENIX GEMs+CsI with  
PVDIS is the way to go

# SIDIS Light-Gas: PVDIS mirror + PHENIX GEMs+CsI

Very good collection efficiency: sharing the mirrors + PHENIX GEMs+CsI with PVDIS is the way to go

## Optimization for low polar angle



No acceptance for  $\theta = 9.3$  deg and  $p < 2$  GeV at  $z = -330$  cm : mirror does not extend enough toward the beamline

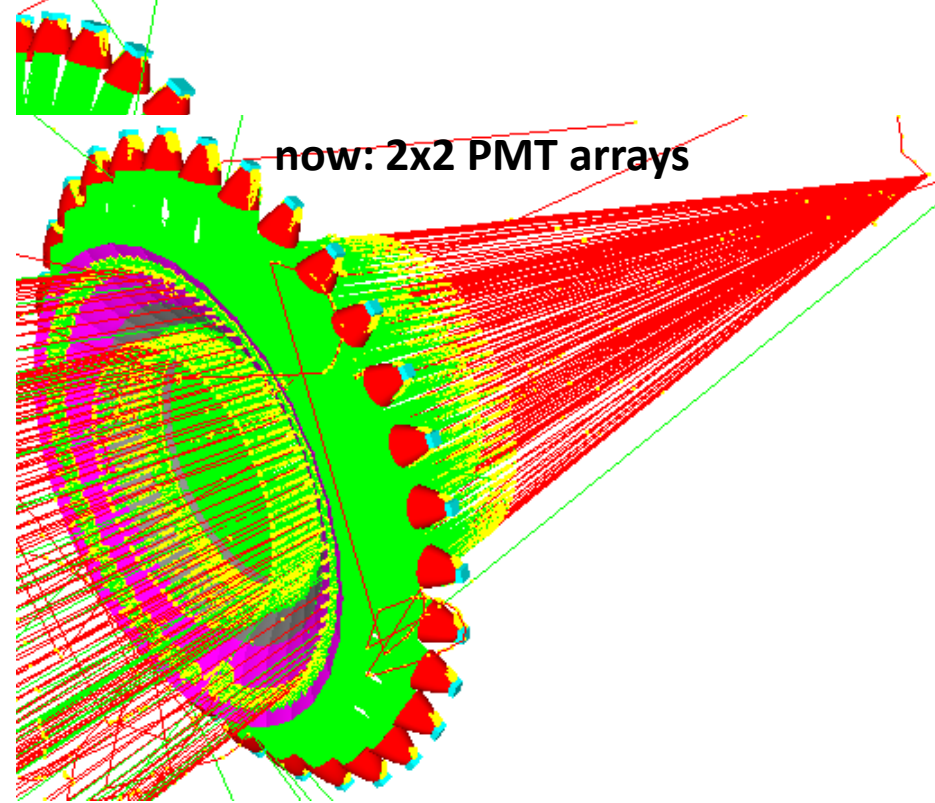
Mirror close to the tank wall

# SIDIS Light-Gas: PMT Option

- Mirrors too long to be manufactured in one piece
- Need to figure out a way to mount the mirrors in order to reduce the dead zone in the angular acceptance: will talk to Gary Swift (Duke)
- Advantage: we could now try to reduce the size of the photon detector by making the parts of each spherical mirror of different curvature: **work in progress**
- Preliminary results: it is possible to go from 3 X 3 to 2 X 2 PMT arrays for the L.-G. SIDIS Cherenkov and still keep very good collection efficiency by making the 2 parts of each spherical mirror of different curvature

Each spherical mirror will come in 2 parts (grey and pink)

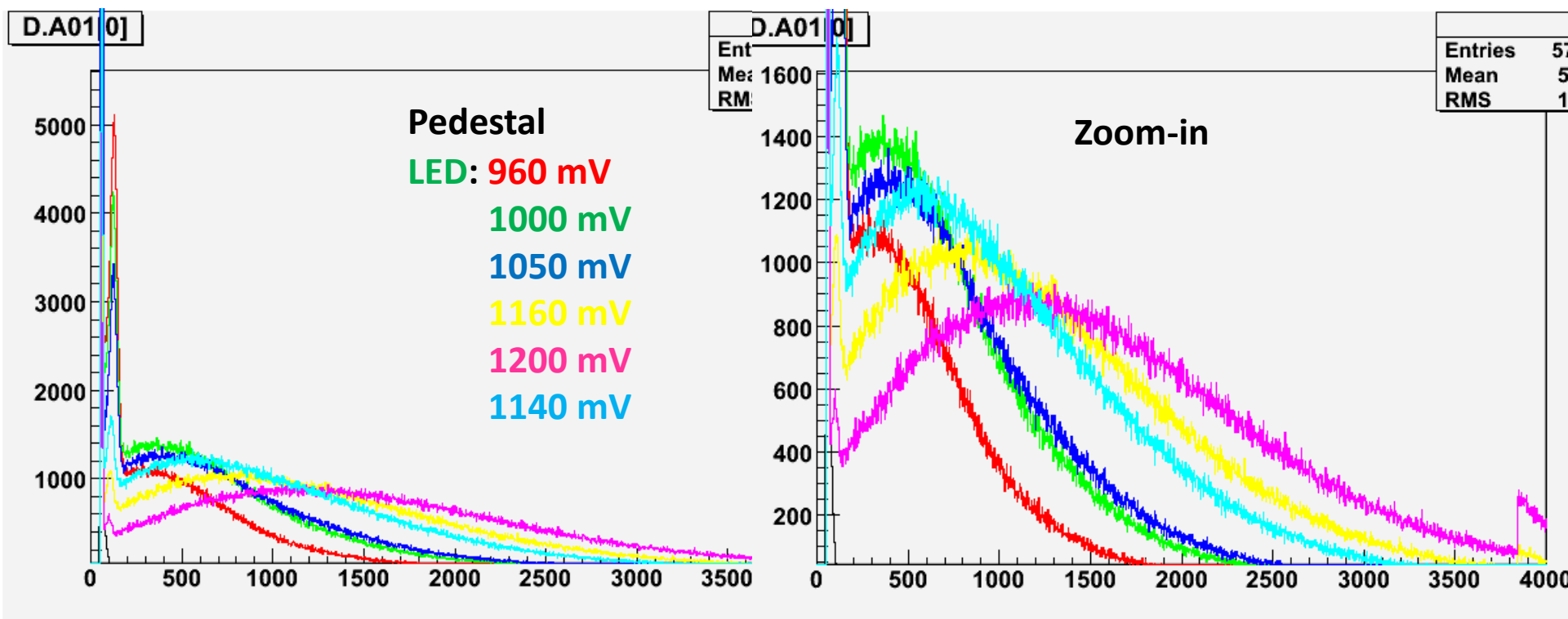
then: 3x3 PMT arrays



# maPMT H8500 Tests

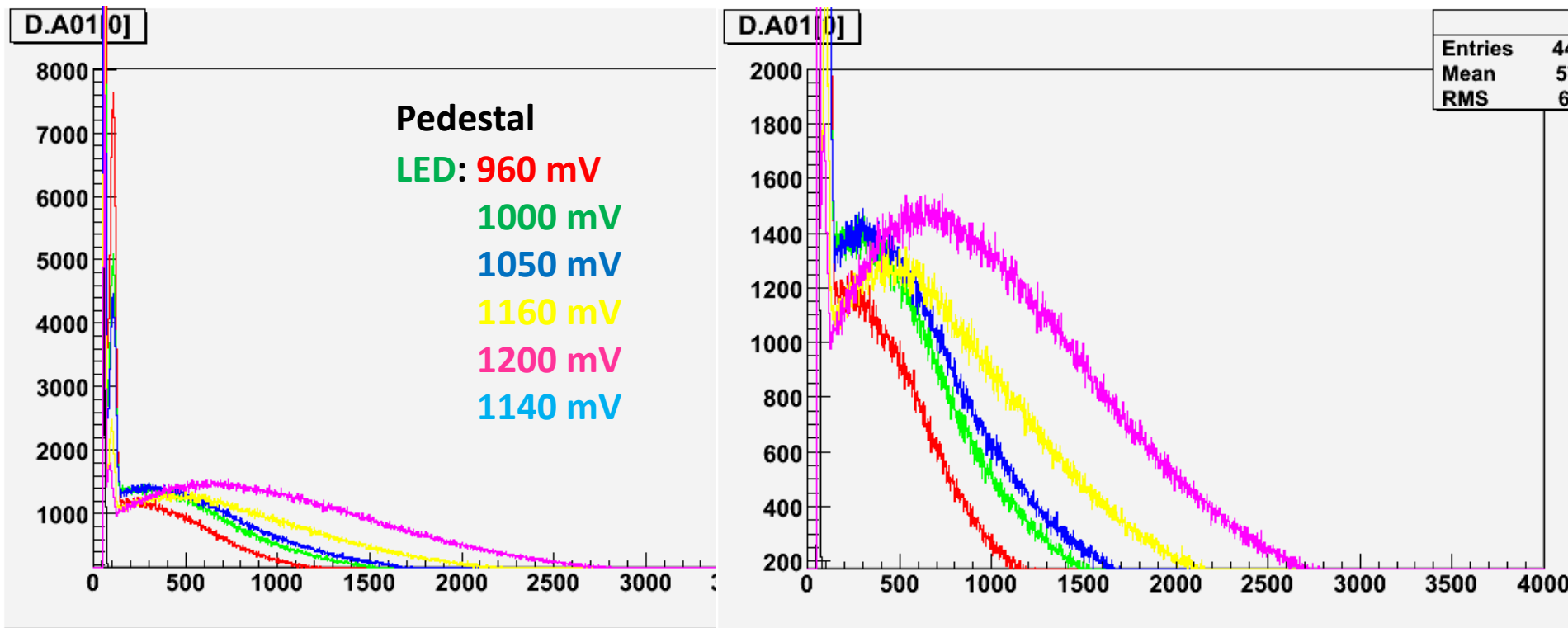
- Looking for the 1-photoelectron signal: needed to obtain an accurate number of photoelectrons from the ADC distributions
- Not successful so far: the PMT noise appears to overwhelm the 1-photoelectron signal

gate = 200 ns (intentionally made wide to cancel out noise)



# maPMT H8500 Tests

gate = 100 ns



- Need to try two things:
  - use the output of only one pixel: right now there is a sum over all pixel although the LED shines just on one pixel
  - cool down the PMT, this could help with the noise