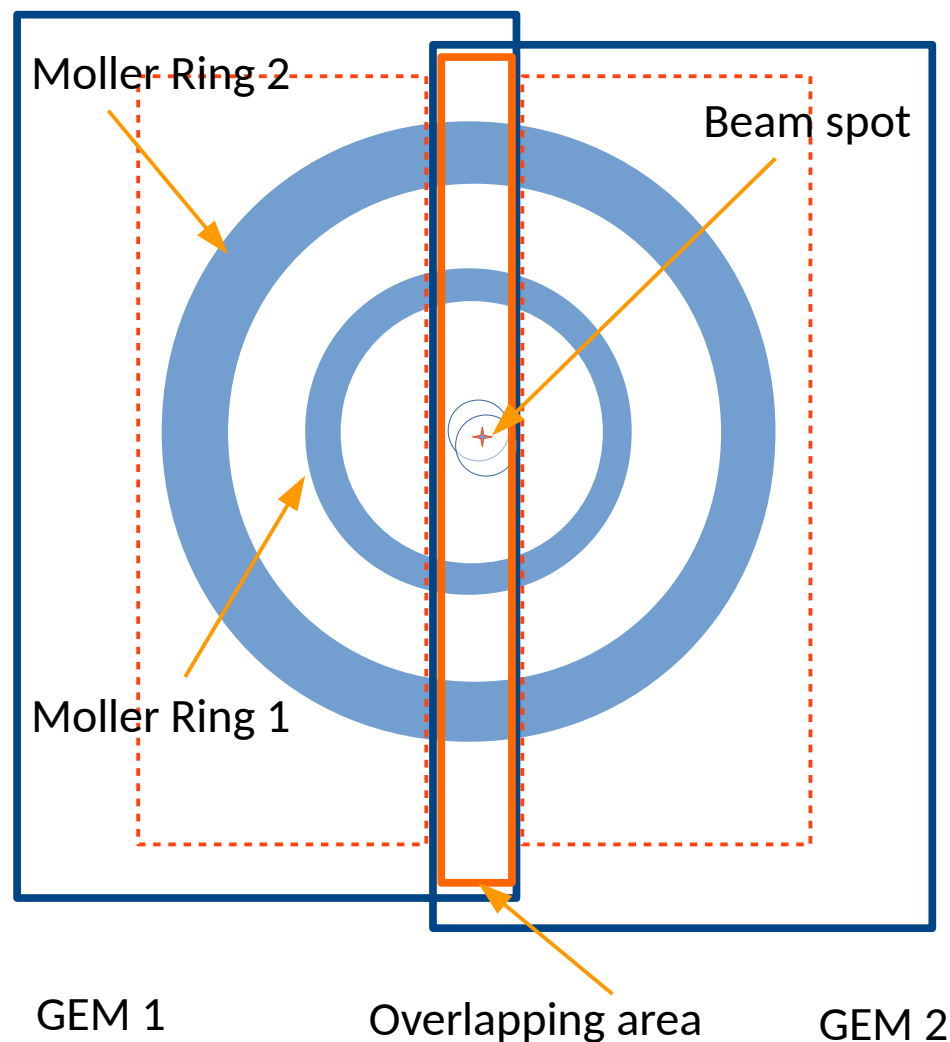


# GEM offsets from Production Run

Use overlapping area Moller events to find offsets for each chamber.

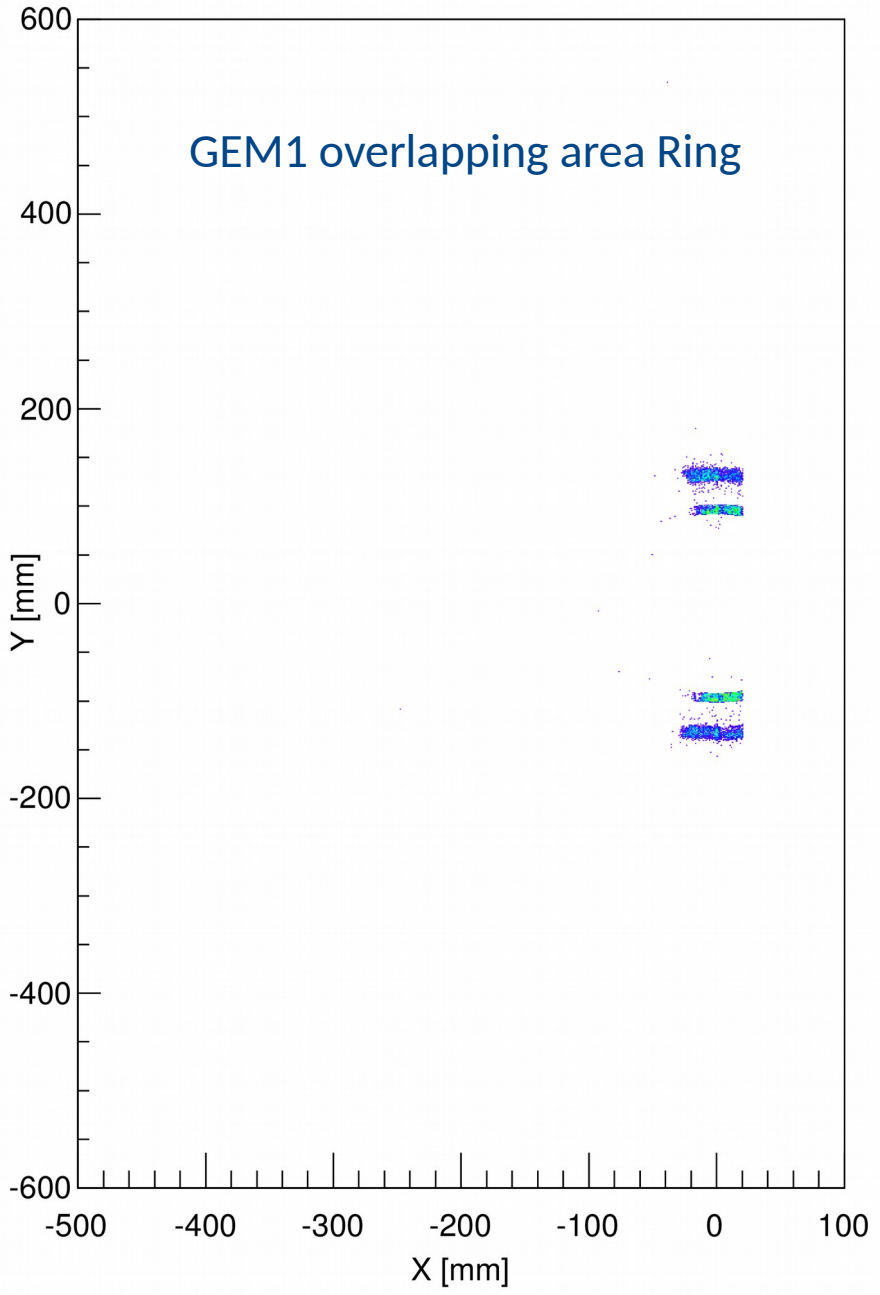
To be more specific:

- 1), find moller events on gem1, construct Moller center for these events, and find the offset:  $X_{\text{moller\_center}} - X_{\text{origin}}$ .
- 2), Same for gem2.
- 3), So both gem offsets will be corrected relative to beam position.
- 4), beam position uncertainty can be get from epics data: On BPM2C24:  
(x : 35um, y: 82 um)



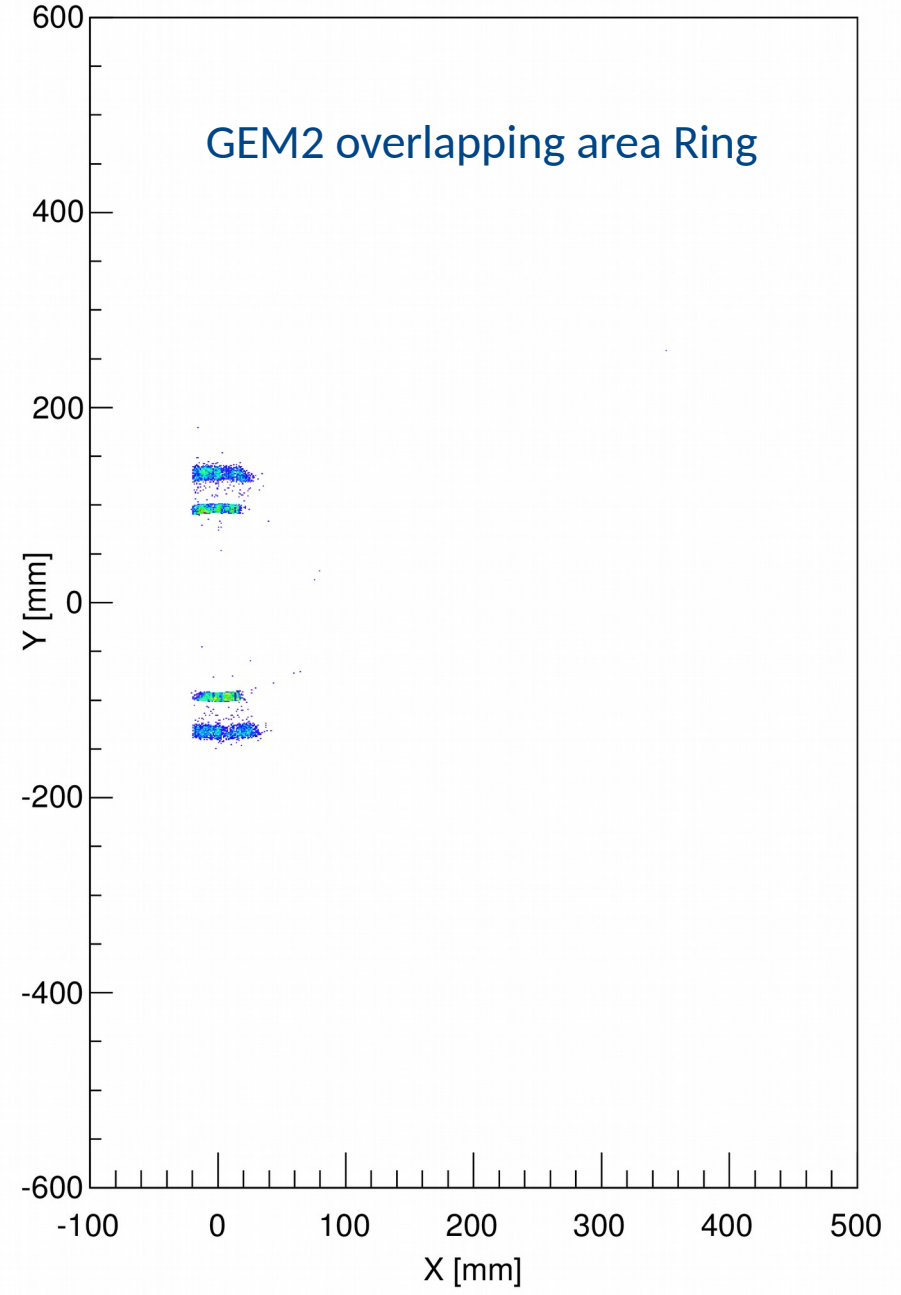
prod\_gem1\_scattyprod\_gem1\_scattx (prod\_gem1\_angle1>1.0 && prod\_gem1\_angle1<1.1 && prod\_gem1\_energy1+prod\_gem1\_energy2>2100 && prod\_gem1\_energy1+prod\_gem1\_energy2<2200)

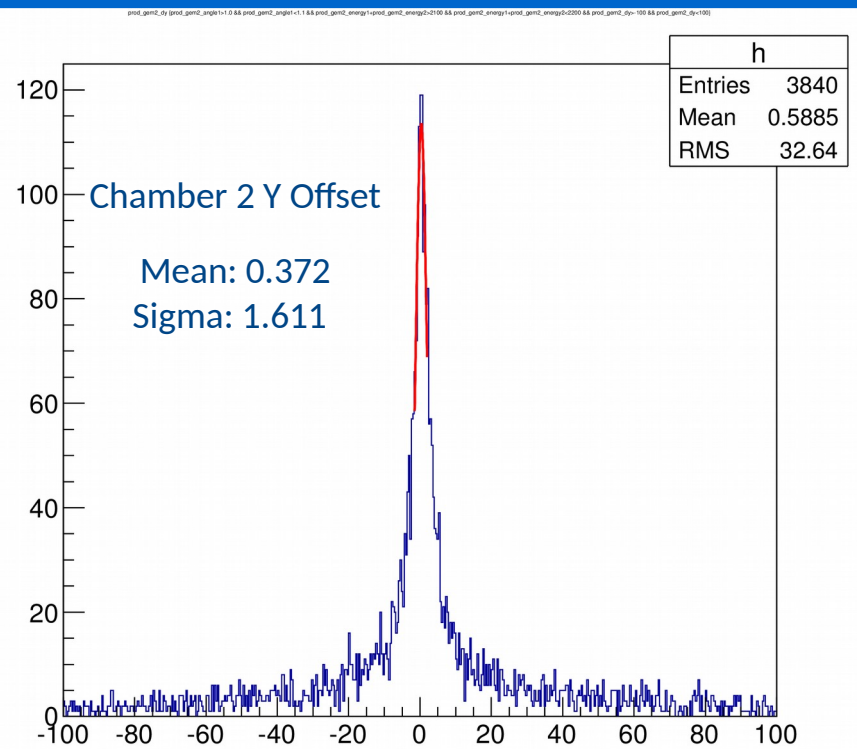
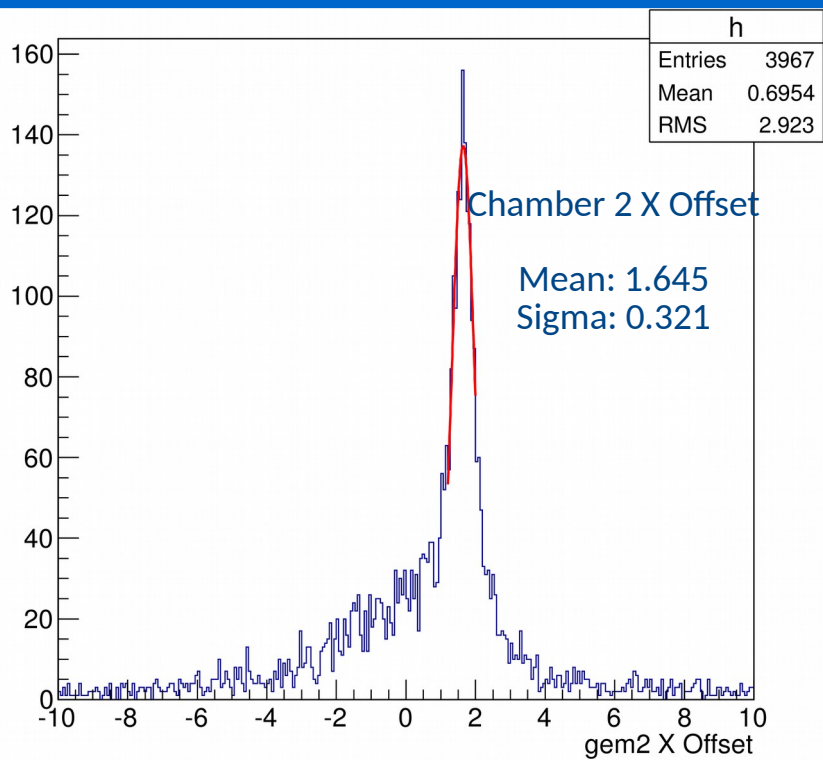
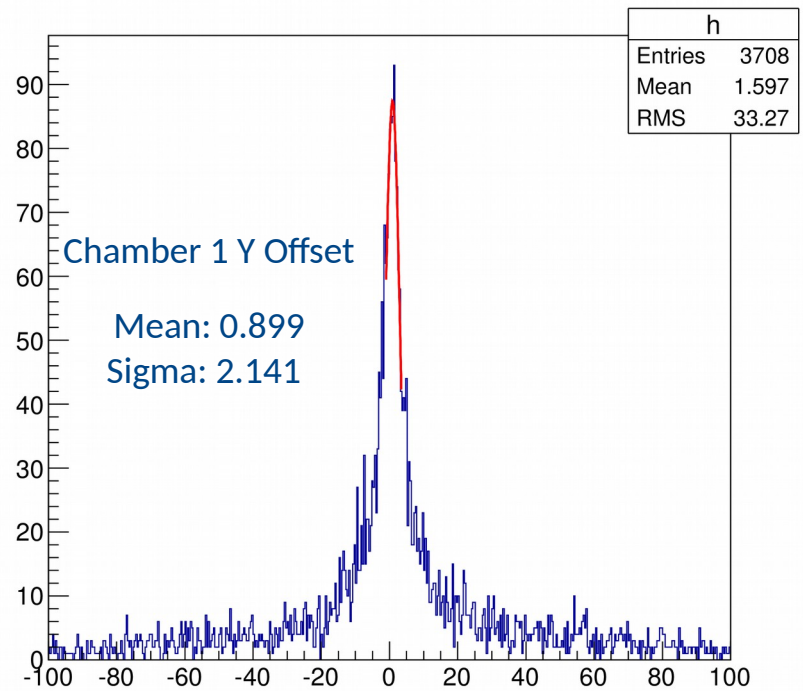
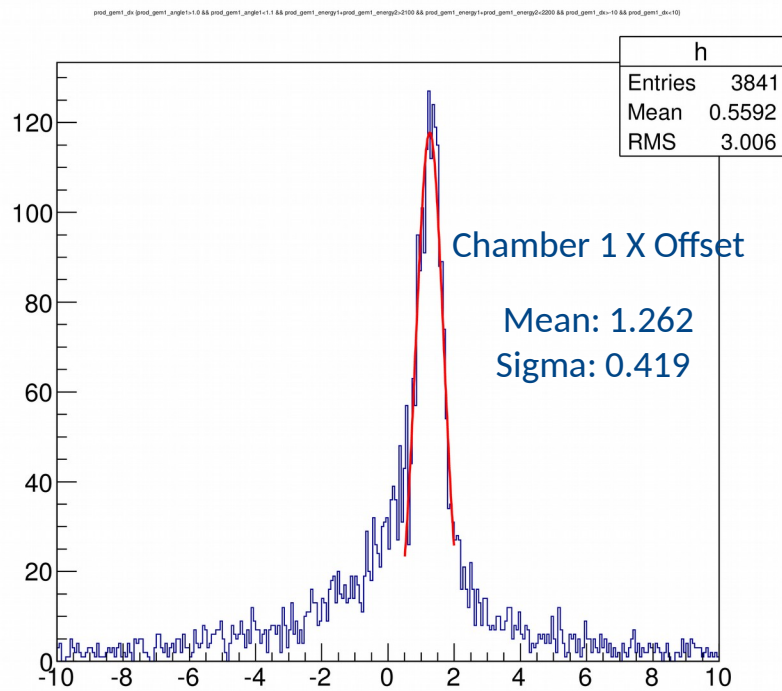
GEM1 overlapping area Ring



prod\_gem2\_scattyprod\_gem2\_scattx (prod\_gem2\_angle1>1.0 && prod\_gem2\_angle1<1.1 && prod\_gem2\_energy1+prod\_gem2\_energy2>2100 && prod\_gem2\_energy1+prod\_gem2\_energy2<2200)

GEM2 overlapping area Ring



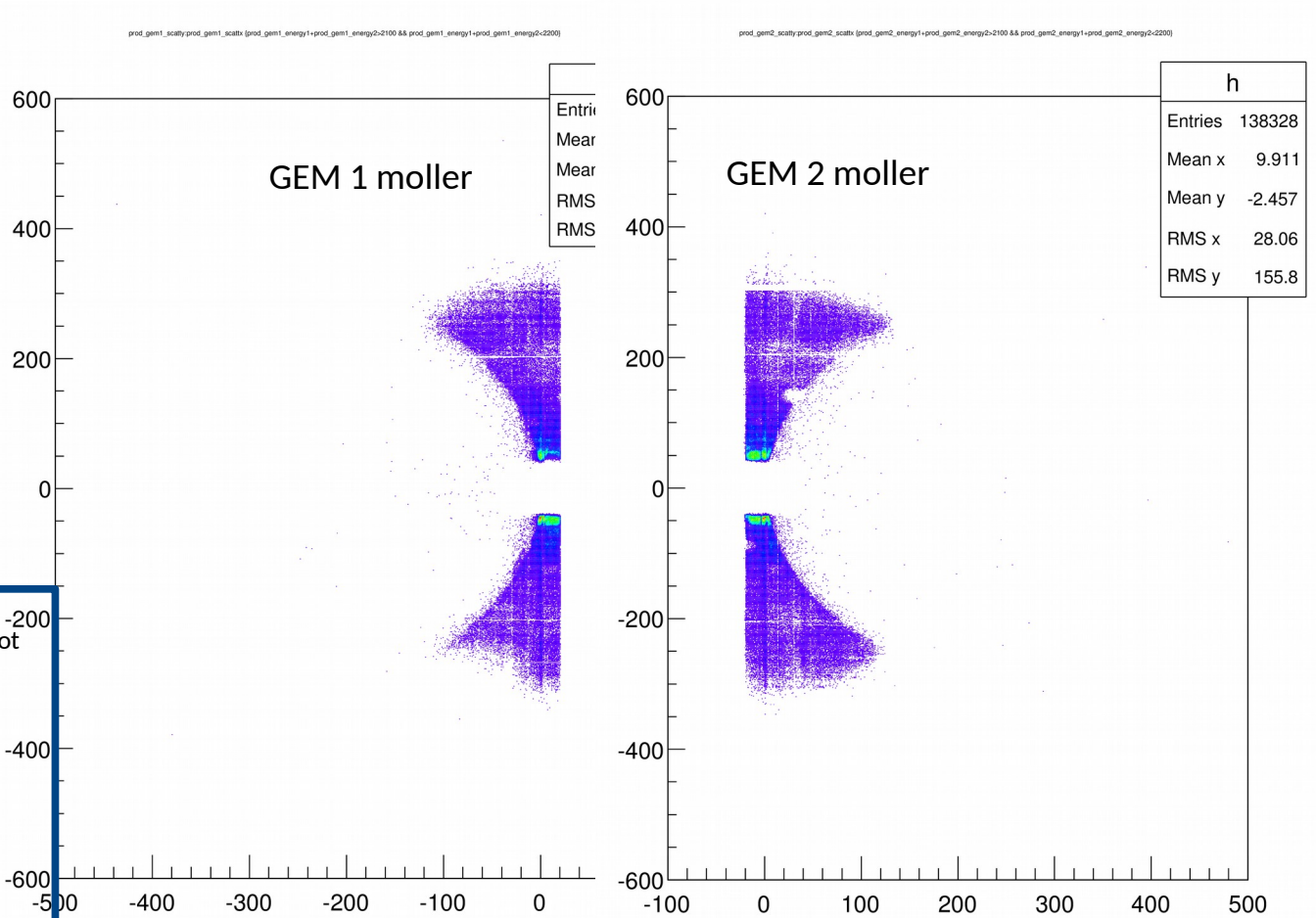
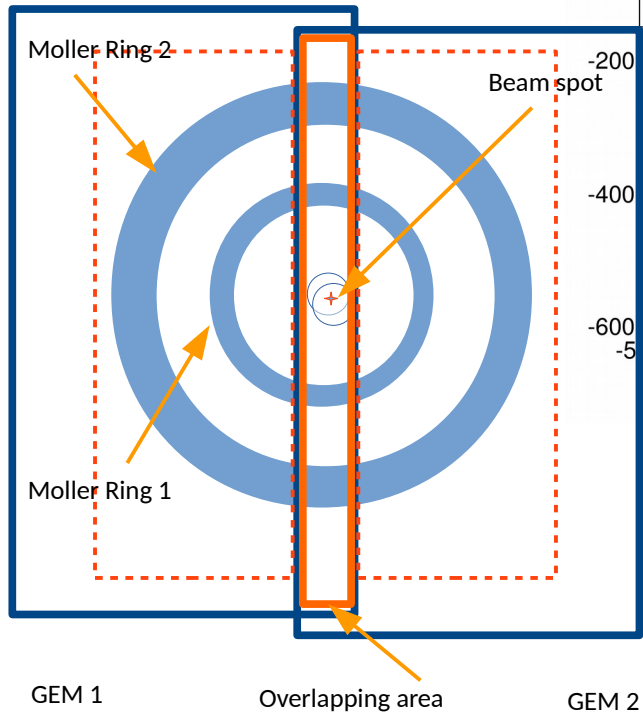


A little more things:

- 1), No Z dependence.
- 2), Carbon Run, Production run should both be OK.
- 3), Events are few (1.5%). Can cut ~4000 Events per Run with cut. ~120k without angle cut.  
(When restricting inner moller scattering angle to be between 1.0 deg and 1.1 deg.)

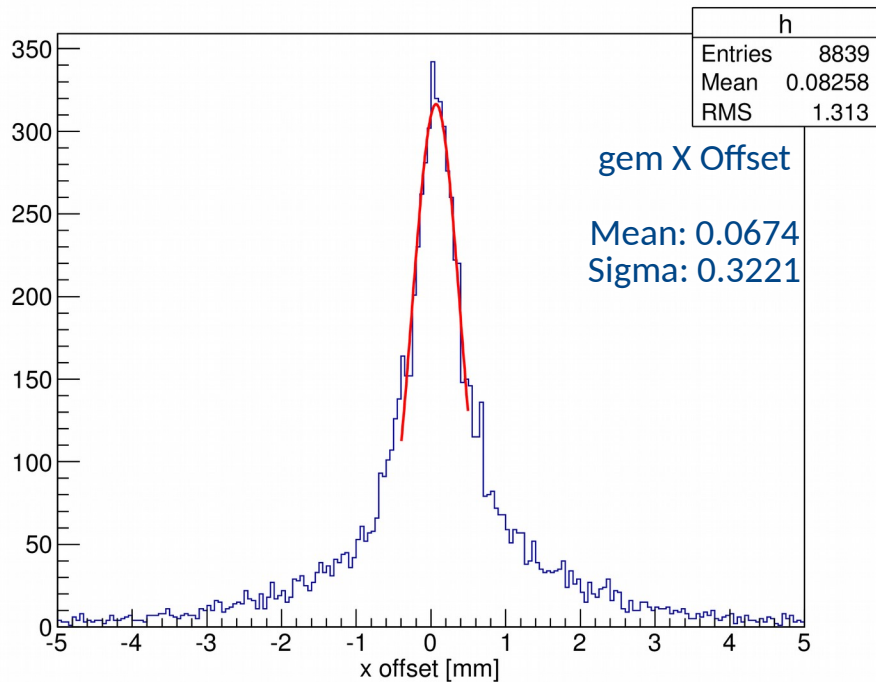
- 4), X and Y cut are not symmetric, overlapping area is 44mm, lead us to cut events in the region of
  - 22 mm < X < 22 mm
  - 600 mm < Y < 600 mm

So Y offset distribution has a much wider sigma.

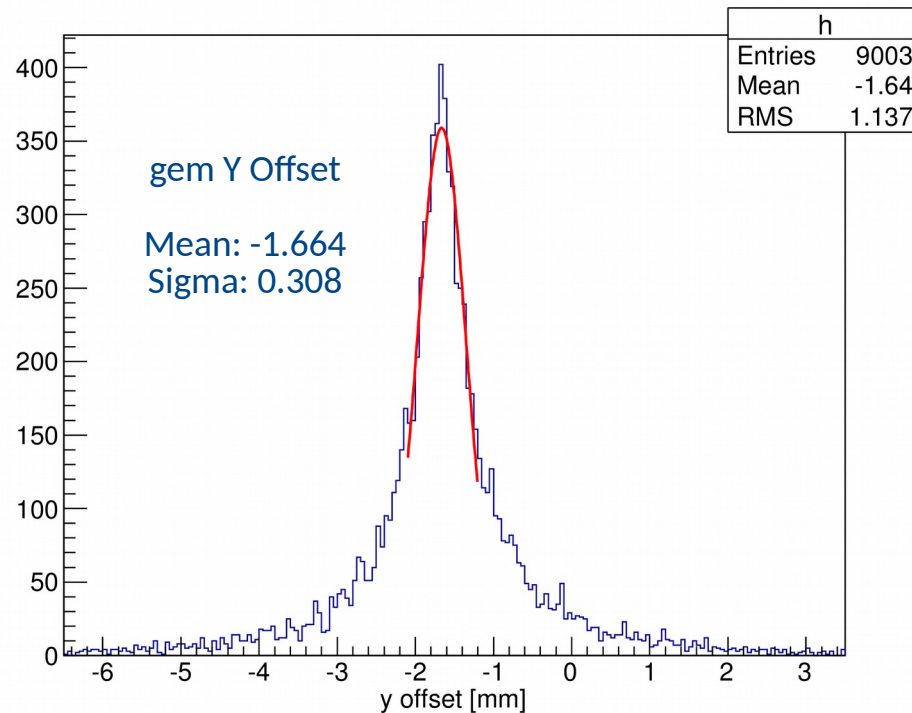


# GEM offsets from Calibration Run

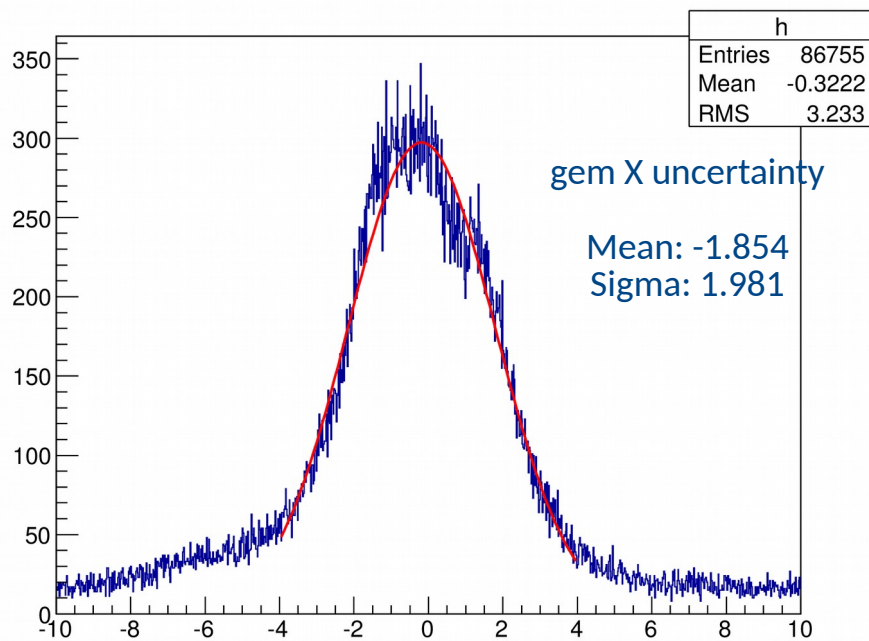
## X Offset



## Y Offset



moller\_pos\_res\_dx {moller\_pos\_res\_dx>-10 && moller\_pos\_res\_dx<10}



moller\_pos\_res\_dy {moller\_pos\_res\_dy>-10 && moller\_pos\_res\_dy<10}

