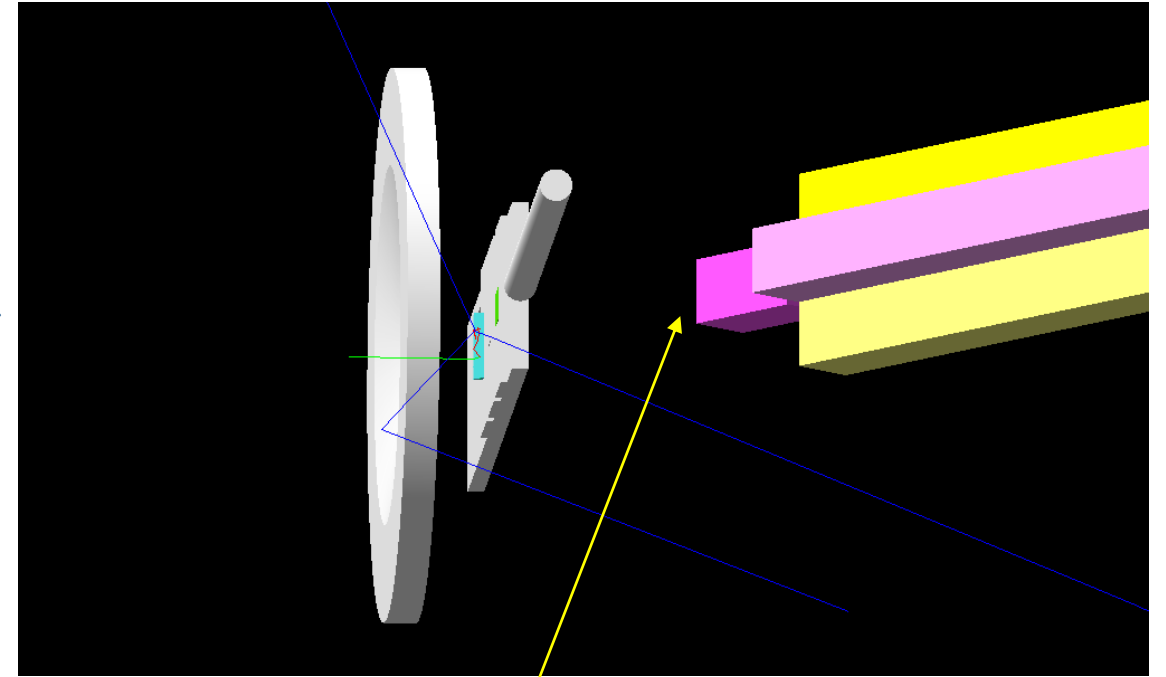
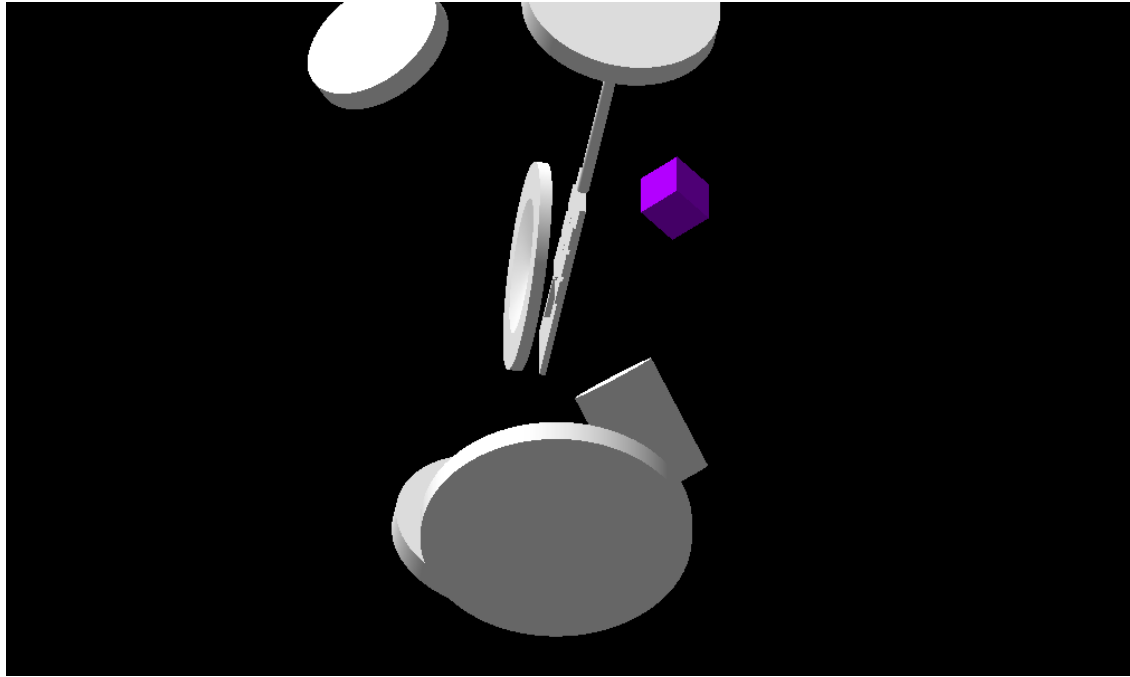


# Positronium measurement preparation

Bongho Kim

# Scheme of new PWO detector

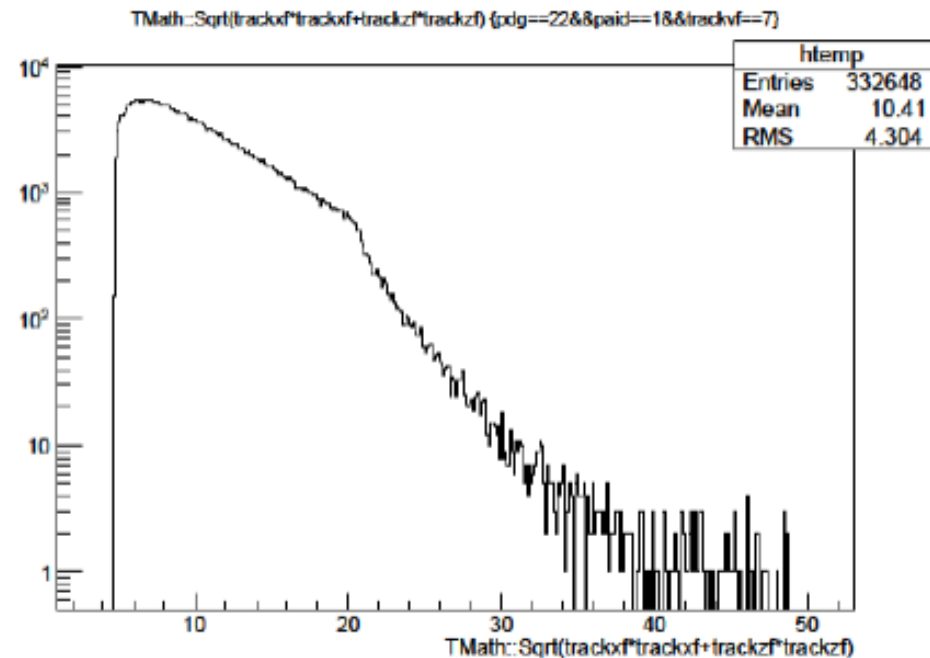
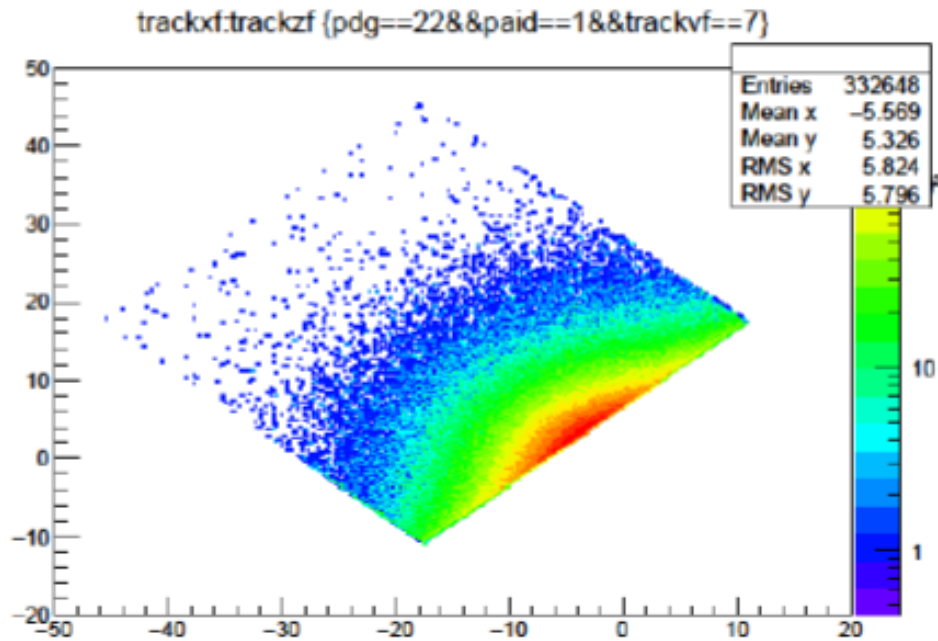


- 2x2x20cm PbWO<sub>4</sub> crystals are in Korea (#6)
- I plan to purchase PMT (H9880 D8mm)
- Original PbWO<sub>4</sub> detector (4x4x3.8cm crystal with 1 PMT)  
+ new PbWO<sub>4</sub> detector (2x2x20cm crystals(5 or 3) with 5PMTs + 2x2x4cm W block or PWO )

Slide at Aug.2016

PbWO4 block is not enough  
to block 0.5MeV gamma  
 $\rho$  (W) = 19.3g/cm<sup>3</sup>;  
 $\rho$  (pwo)=8.3g/cm<sup>3</sup>

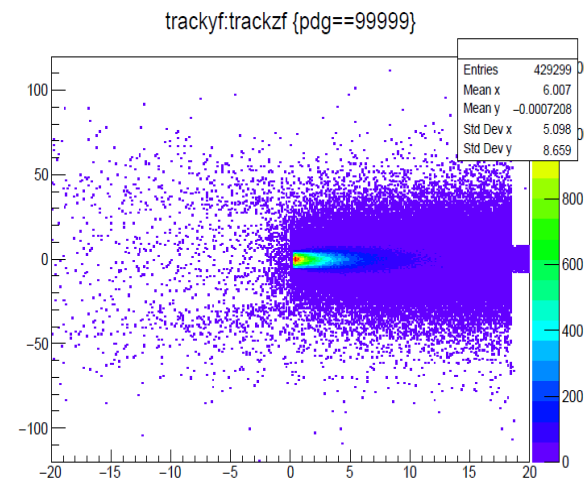
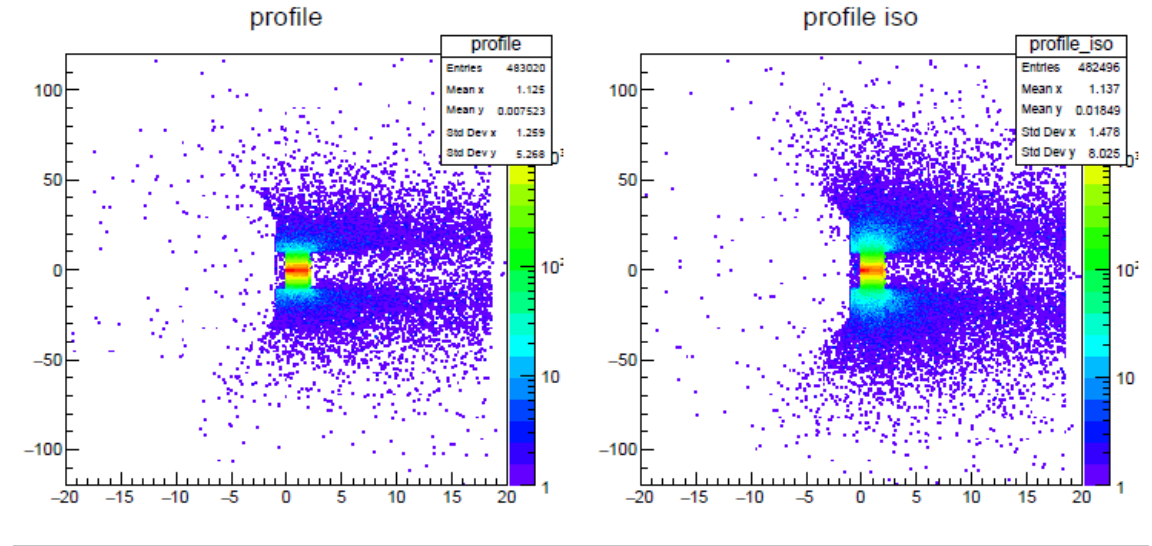
# Required W block Thickness



- If we use W block t=2cm, we can reduce 99% of annihilation gamma.
- If we use W block t= 4cm, we can reduce 99.95% annihilation gamma.

# Positronium projection distribution

- Without Si<sub>3</sub>N<sub>4</sub> film penetration issue
- Distribution with 2mm x 2mm x 1cm target cavity
- Isotropic and cosine show big difference for projection distribution.



So,

- W block maybe required to check the positronium angle distribution
- Distance btw W block and detector, distance between target and W block, etc have been tested.