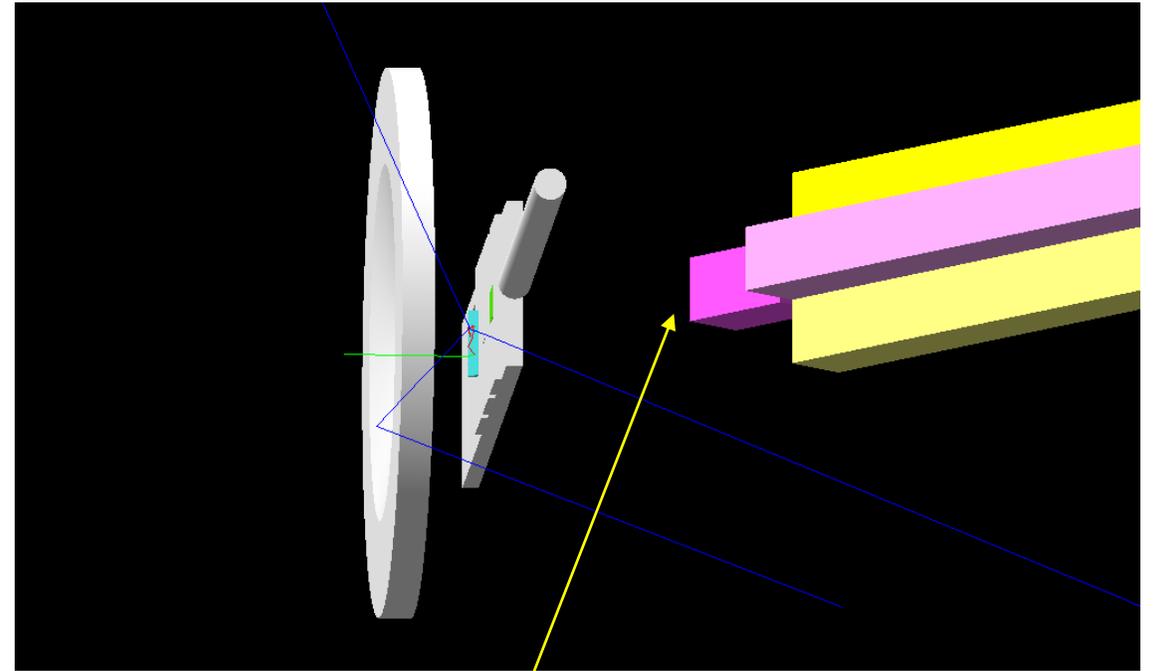
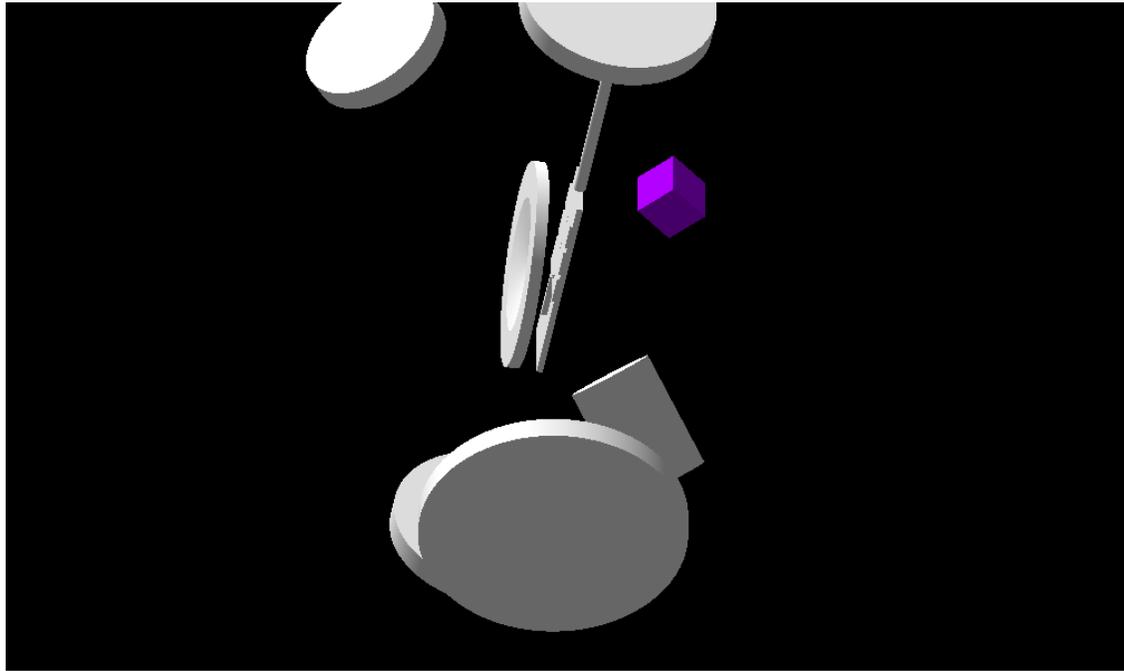


Positronium measurement preparation

Bongho Kim

Scheme of new PWO detector

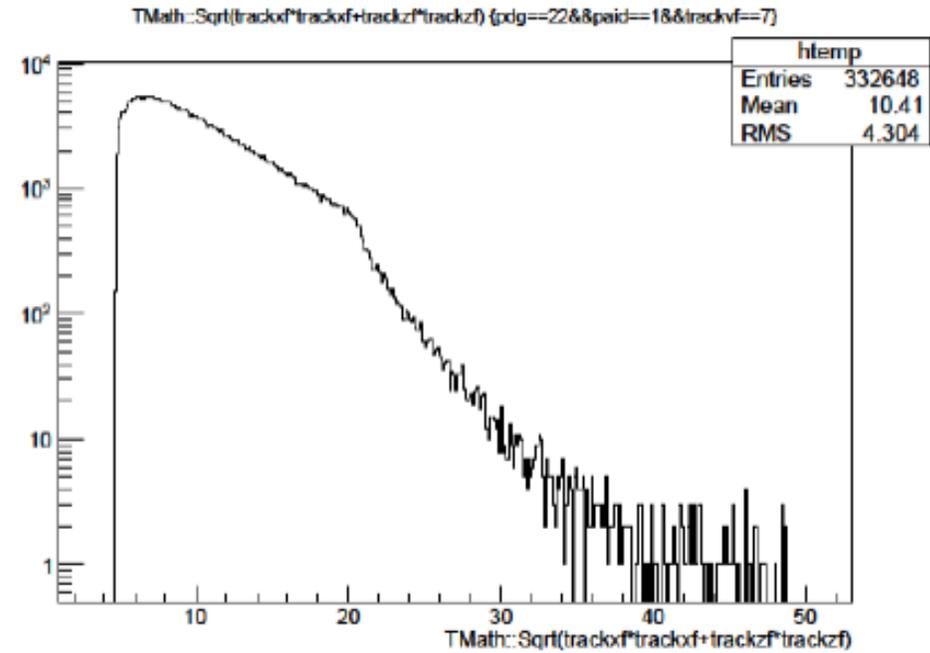
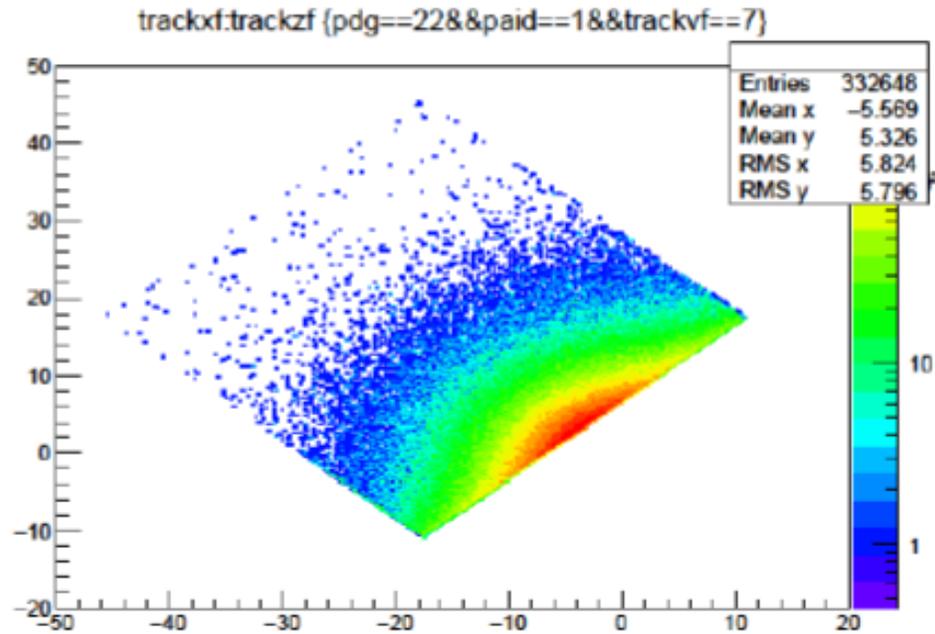


- 2x2x20cm PbWO4 crystals are in Korea (#6)
- I plan to purchase PMT (H9880 D8mm)
- Original PbWO4 detector (4x4x3.8cm crystal with 1 PMT)
+ new PbWO4 detector (2x2x20cm crystals(5 or 3) with 5PMTs + 2x2x4cm W block or PWO)

Slide at Aug.2016

PbWO4 block is not enough
to block 0.5MeV gamma
 $\rho (W) = 19.3\text{g/cm}^3$;
 $\rho (\text{pwo})=8.3\text{g/cm}^3$

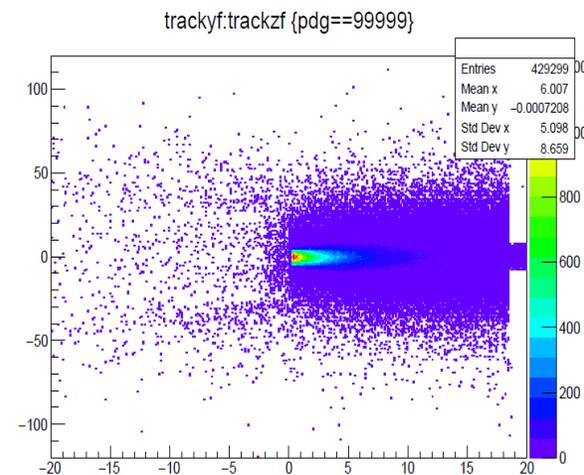
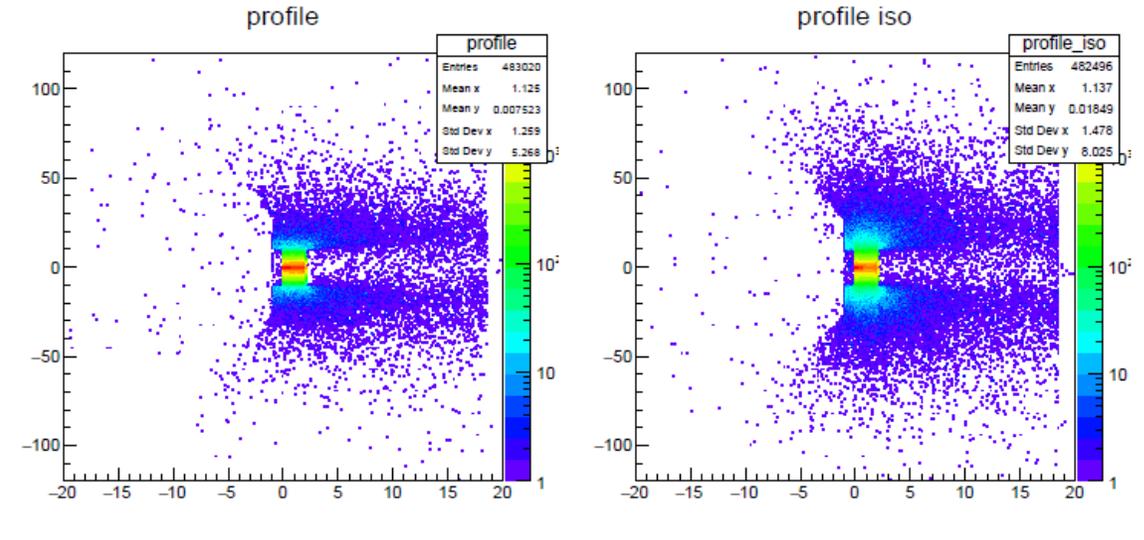
Required W block Thickness



- 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 Si₃N₄ 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.