

Positronium intensity measurement preparation (GBAR)

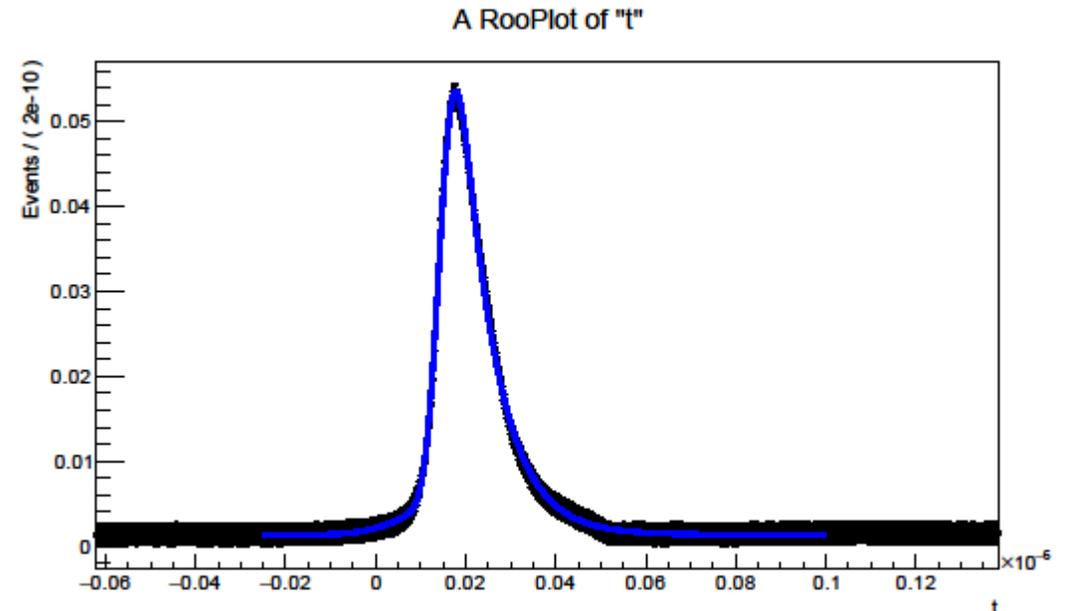
SNU

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Raw signal fitting

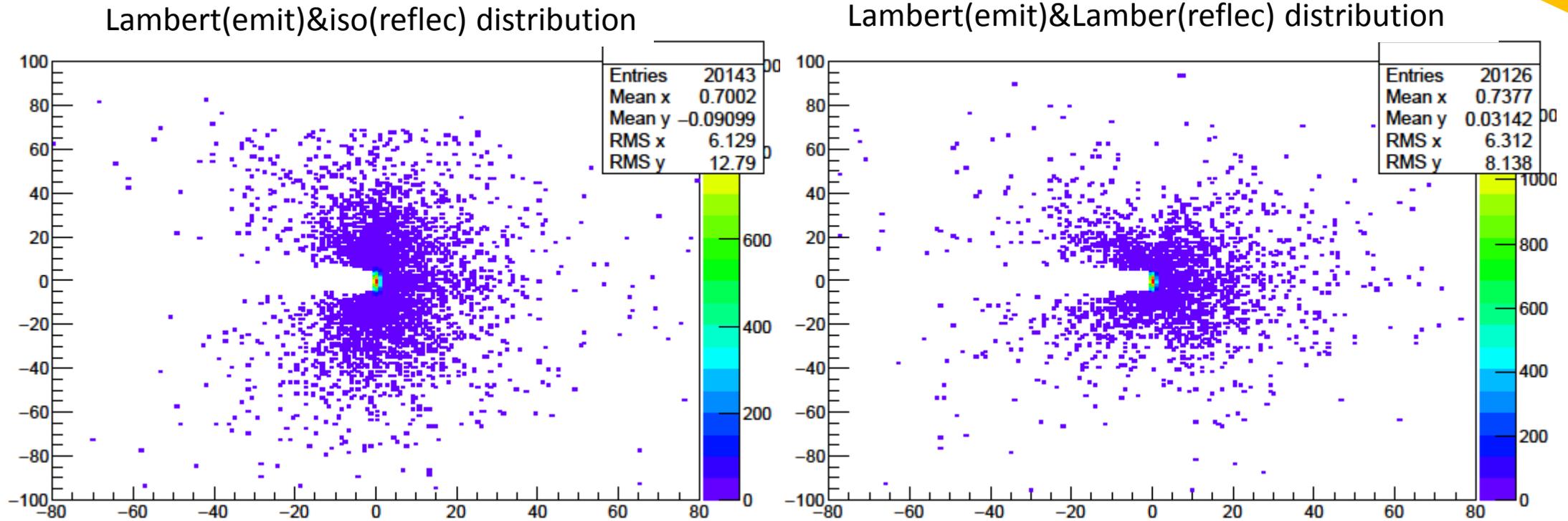
- Gauss (x) exp(-t/tau) + Gauss_a + poly(1)
- $\chi^2/\text{ndf} = 37$
- Tau = 7.65ns
- Fraction(Gauss (x) exp / Gauss_a) = 0.905

Fitting become better (fail to fit by exp(ax)*exp(-bx) function..)



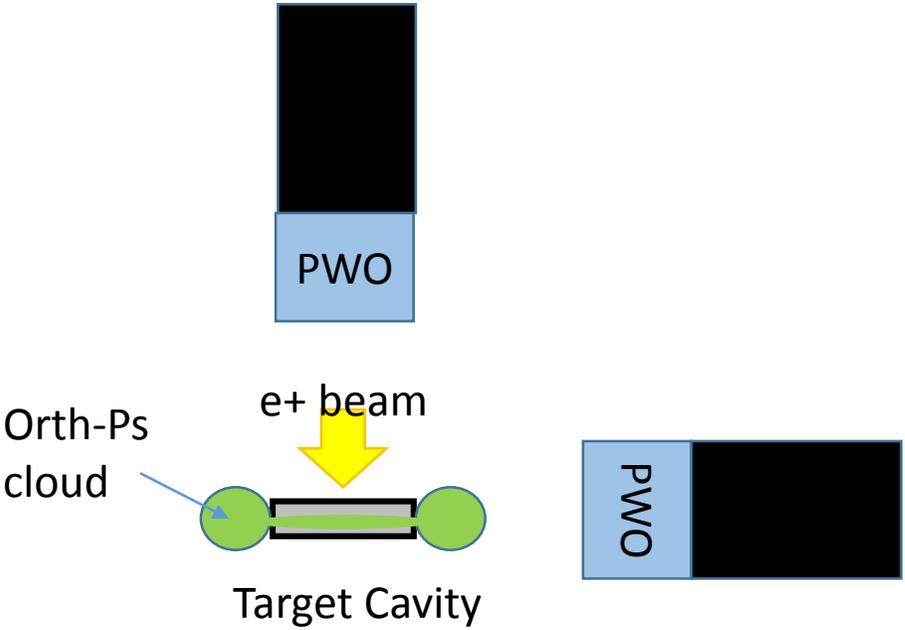
Positronium diffusion (reflection)

Last slide

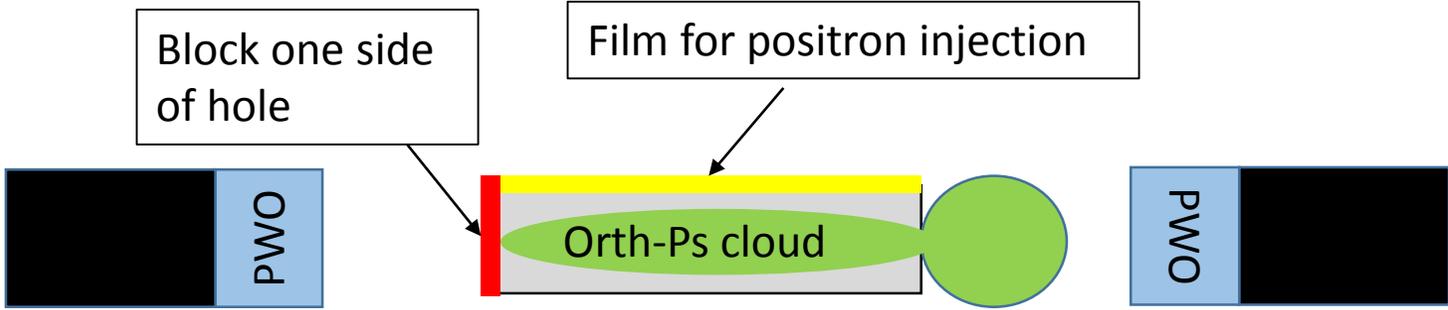


- Lambert(reflection) case : 84.5% of positronium remain in cavity before decayed
- Isotropic case(reflection) : 69.9% of positronium remain in cavity before decayed
- Quite big difference

How to measure beam spread parameter

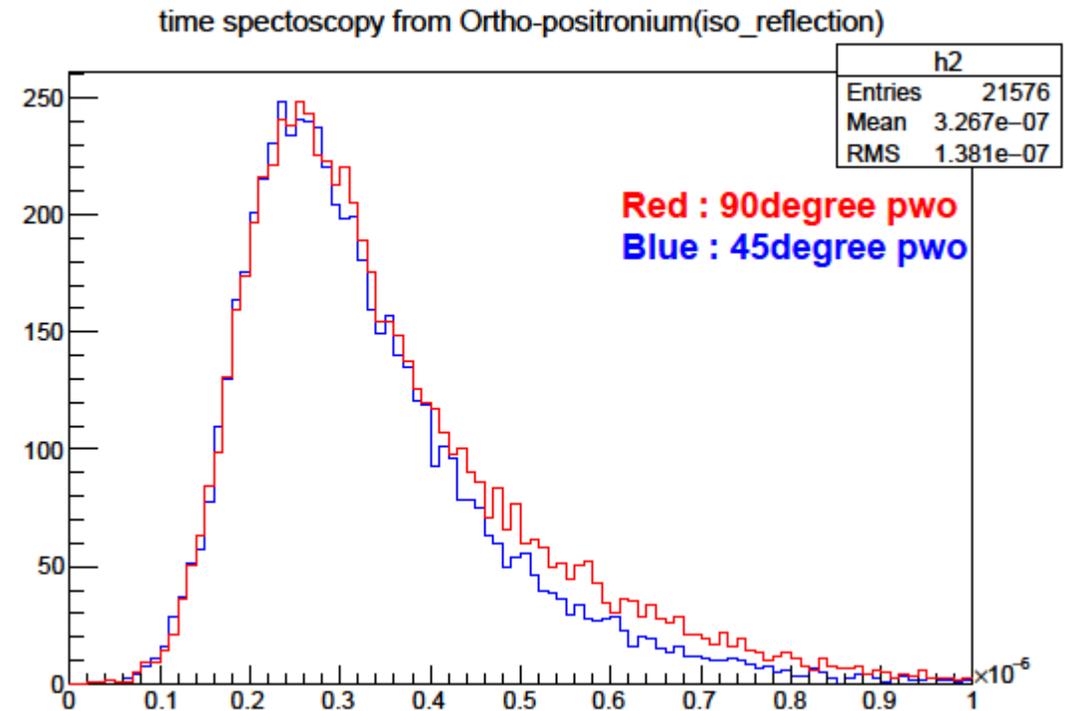
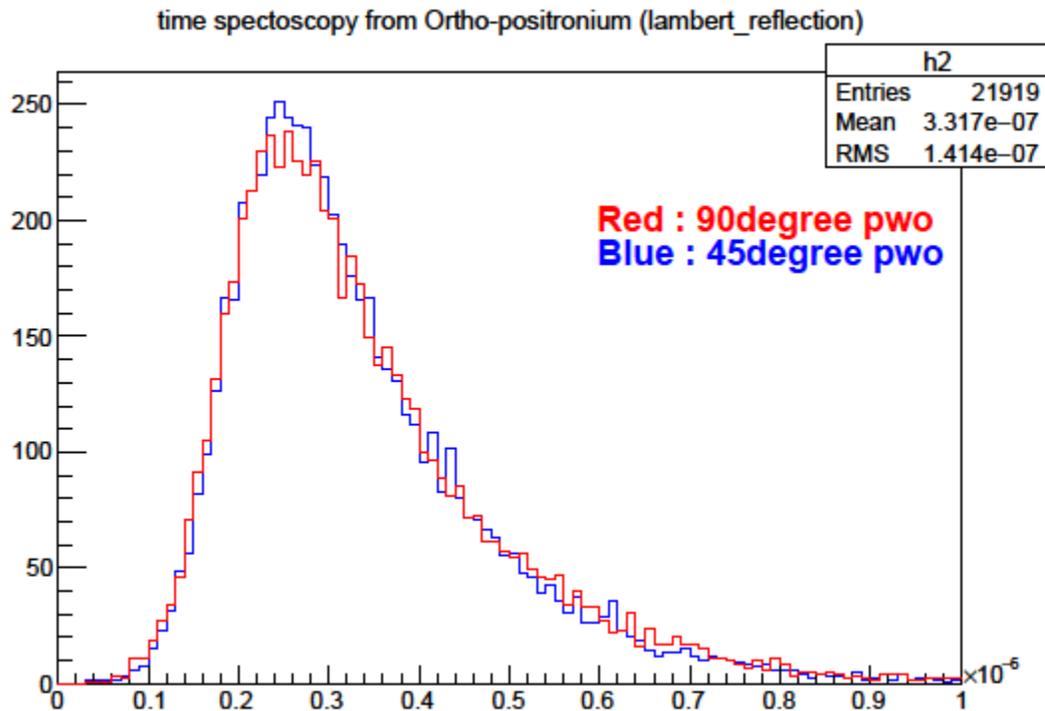


- First way : Detection of gamma by two different angle



- Second way : Detection of gamma in both hole direction with block one side of hole in cavity

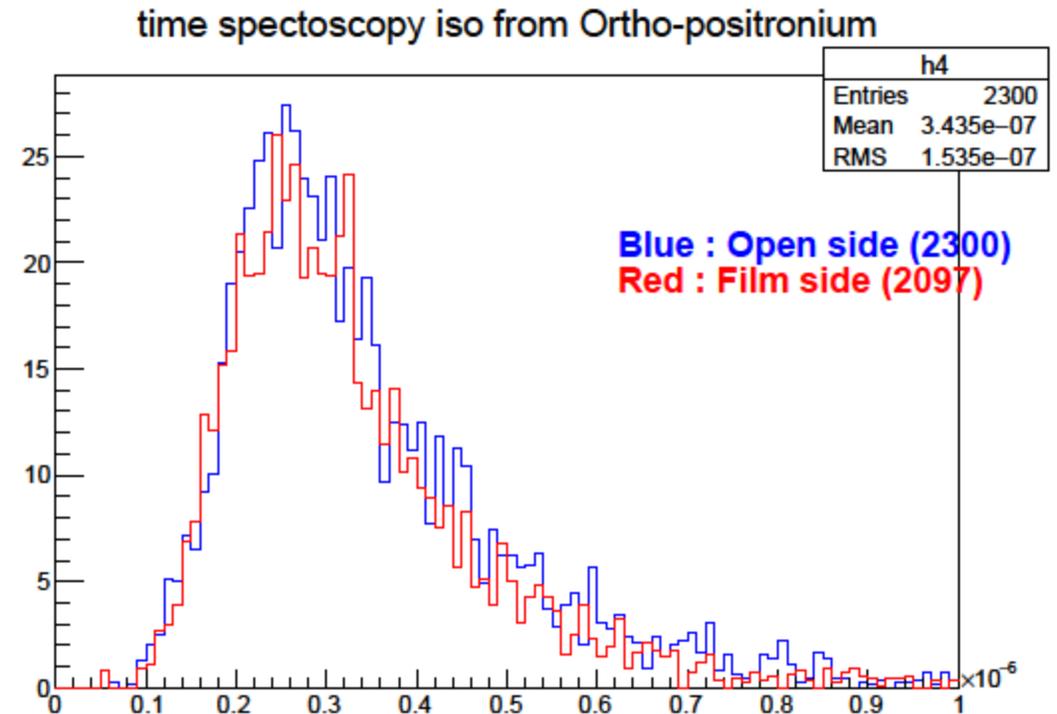
About first way



- But Laszlo said that available detection position is limited and he need to check.

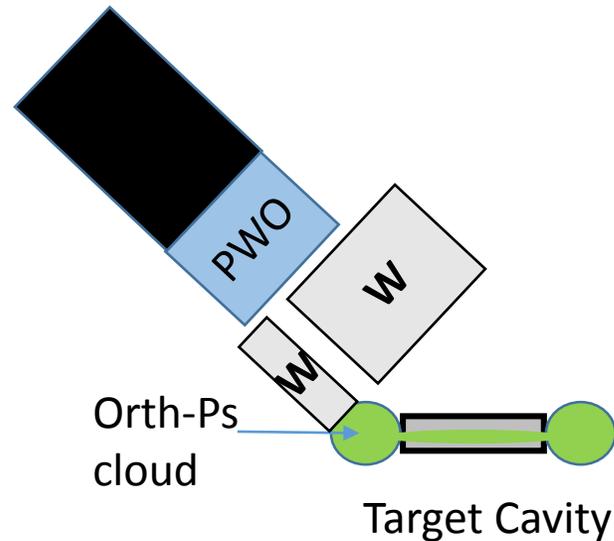
About second way

- 10% difference shown but more statistics required.
- This simulation is for Lambert reflection which shows nothing in firstway.
→ By accumulate two way, we may get some parameter to check it's lambert or isotropic for reflection



Third way

- Add some W(Tunstain) block inside of chamber for TOF measurement.
- I need to check with several geometry to find adequate one
(All flange direction is to center so hard to check side positronium)



So

- Without precise geometry, it's hard to design of detector& supporting stuff..
- Check simulation with different cavity size (if hole size is big, Positronium formation angle will be important than reflection)
- Check time resolution with fitting