

TOF calibration and e^+e^- difference in Dec11 run

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New TOF calibration

TOF calibration data:

Runs	Description	amount of data
3245, 3248, 3247, 3248	π^+ , 272 MeV/c at D2; Defocused beam for TOF calibration; Decay Solenoid is OFF;	~4500 target pulses
3251	π^+ , 272 MeV/c at D2; Decay Solenoid is OFF	~ 400 target pulses
3511	π^+ , 148 MeV/c at D2; Defocussed positron beam for TOF2 calibration; Decay Solenoid is ON.	~1200 target pulses

Time resolutions:

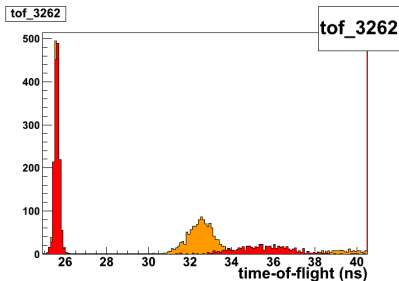
- TOF0 : 55 ps
- TOF1 : 53 ps
- TOF2 : 50 ps

We have ~ 10 ps improvement in the resolution of TOF1 after the refurbished of the detector.

More details about the new TOF calibration in Durga's talk.

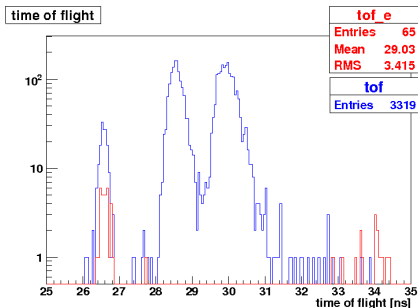
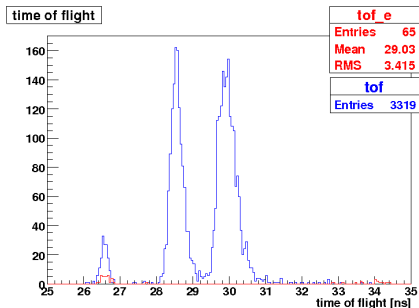
e^+e^- puzzle.

Very low momentum positive pion beams are dominated by e^+ . This is a good opportunity to study the time-of-flight of the positrons.



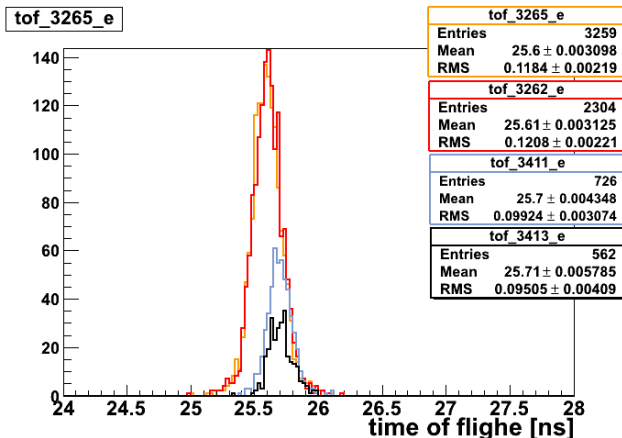
- Run 3259 and run 3411 - 148 MeV/c (in D2).
- Run 3262 and run 3413 - 168 MeV/c (in D2).
- In run 3411 and run 3413 we have $\sim 1 - 2$ particle triggers per spill and $\sim 4 - 6$ hits in TOF0.
- In run 3259 and run 3262 we have $\sim 80 - 100$ particle triggers per spill and $\sim 200 - 300$ hits in TOF0.

Back in 2009.



Very similar beam (in red) has been used to verify our first TOF calibration.

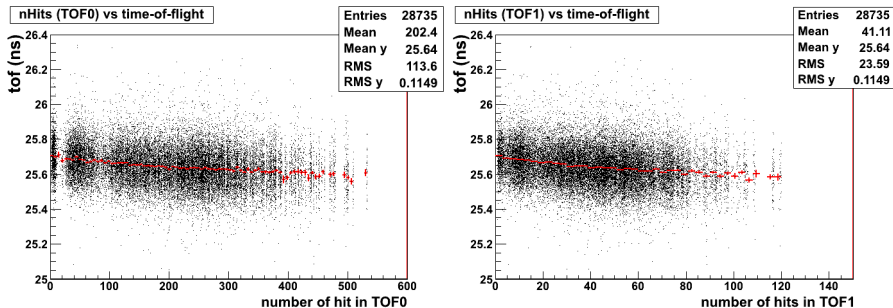
e^+e^- puzzle.



- The variation of the number of particle trigger per spill introduces difference in the measured time-of-flight (~ 100 ps) even when we use identical settings of the beamline channel.

e^+e^- puzzle.

Run 3492 - π^+ , 148 MeV/c at D2, trigger rate between 1 and 70.



- Additional data has been taken, in order to prove the correlation between time-of-flight of the positrons and the event rates in TOF0 and TOF1.

Conclusions

- The " e^+e^- " puzzle seems to be solved. Now we have "rate effect problem".