Analysis of Relative tagging ratio

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Outline:

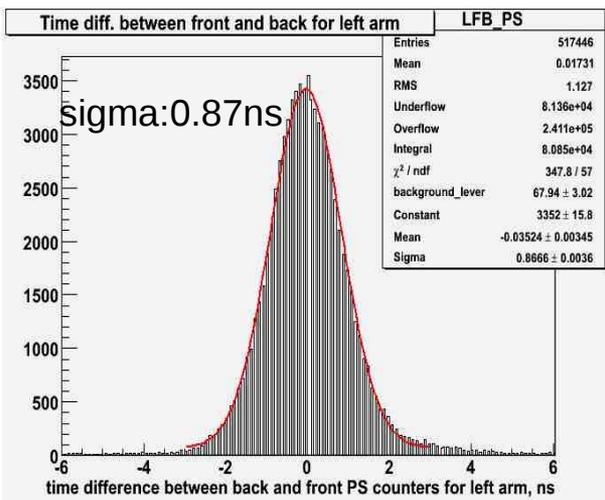1) Algorithm for reconstruction e+e- pair

2) What kind of trigger should be used to analyze relative tagging ratio.

3) Use cut on the time distribution of e- from T-counter

4) For some events, TAGM_LR bank have no hits, but hycal has events

Algorithm for reconstructing e+e- pair

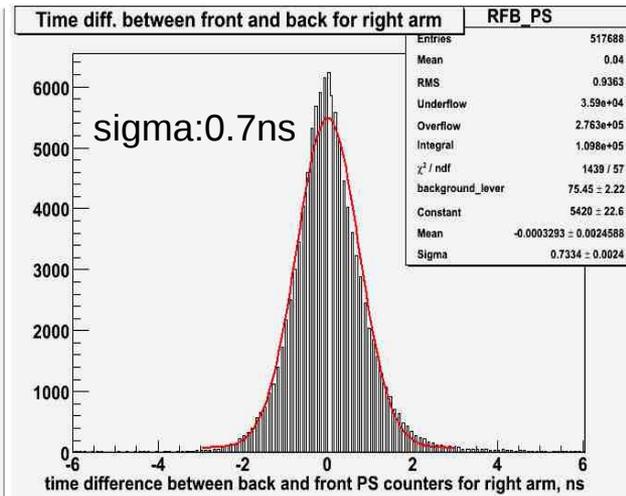1. *Four kinks of Tdiff are used to reconstruction of pair*:

1) Overlap region: Tdiff of two adjacent counters(3 sigma asymmetric cut)

2) Left track: Tdiff of fron and back counters for right arm(5 sigma cut and geometry maching);

3) Right track: Tdiff of fron and back counters for left arm(5 sigma cut and geometry maching);

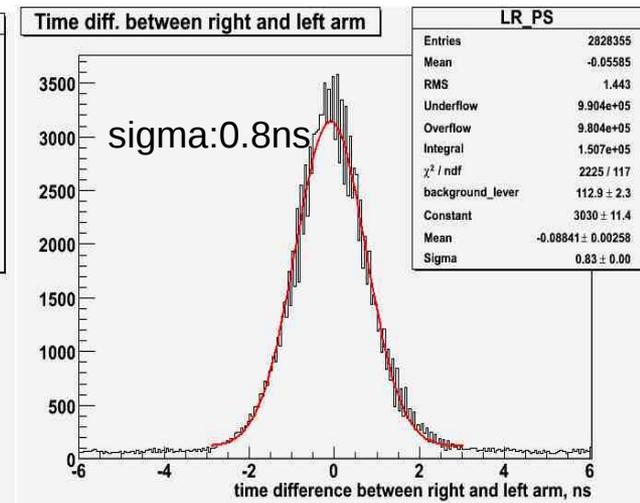4) Pairs: Tdiff of left track and right tracl (5 sigma cut);
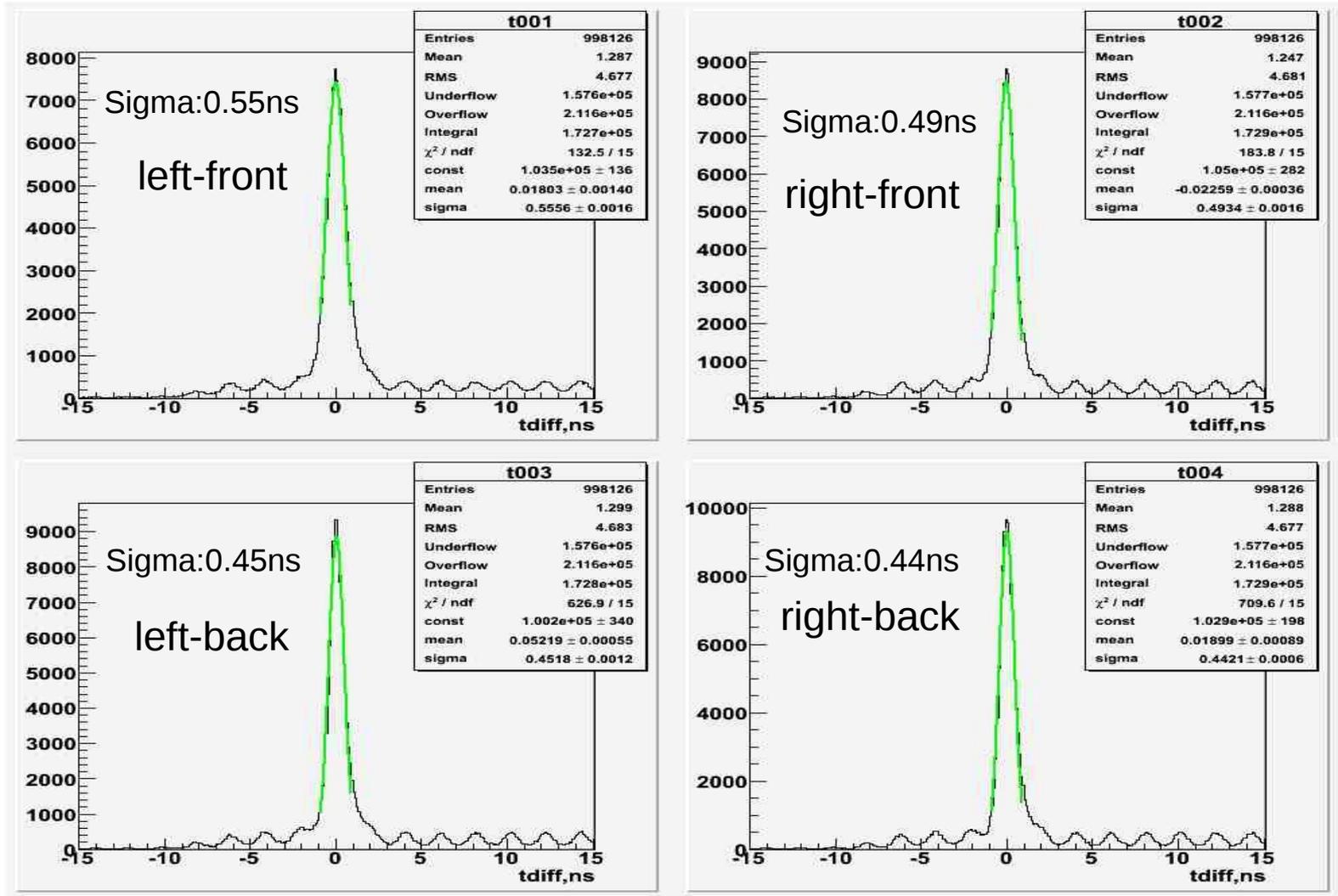
Tdiff of front and back for left arm   Tdiff of front and back for right arm   Tdiff of left and right arm
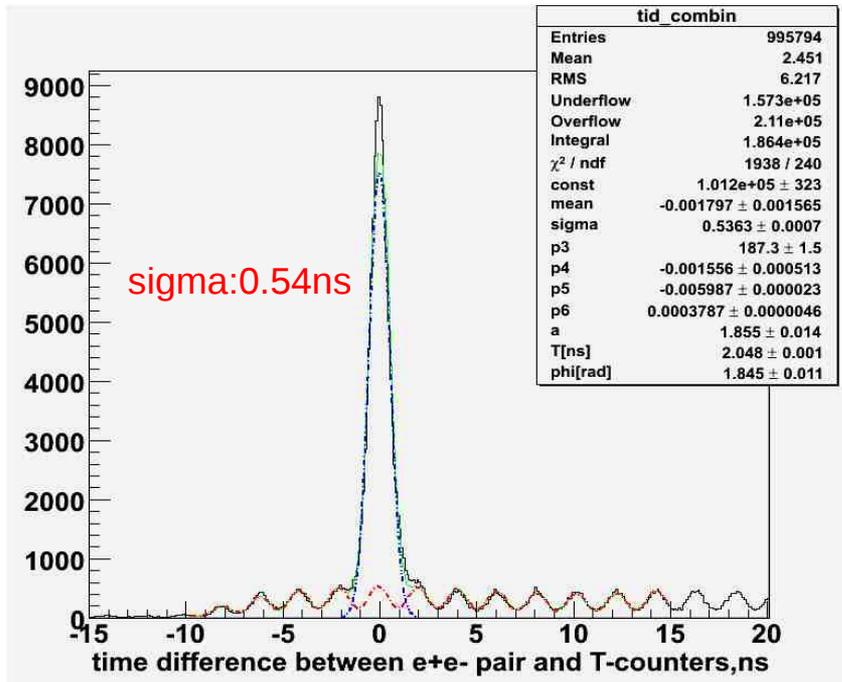

sigma:0.87ns

sigma:0.7ns

sigma:0.8ns

2) Tidff of T-counter and each of four components of pair

4

3) The way of define the time of pair

Tdiff of e+e- pair and all T-counters

Tdiff of e+e- pair and all T-counters

Time of pairs coming from the right-front
Parts of PS counter
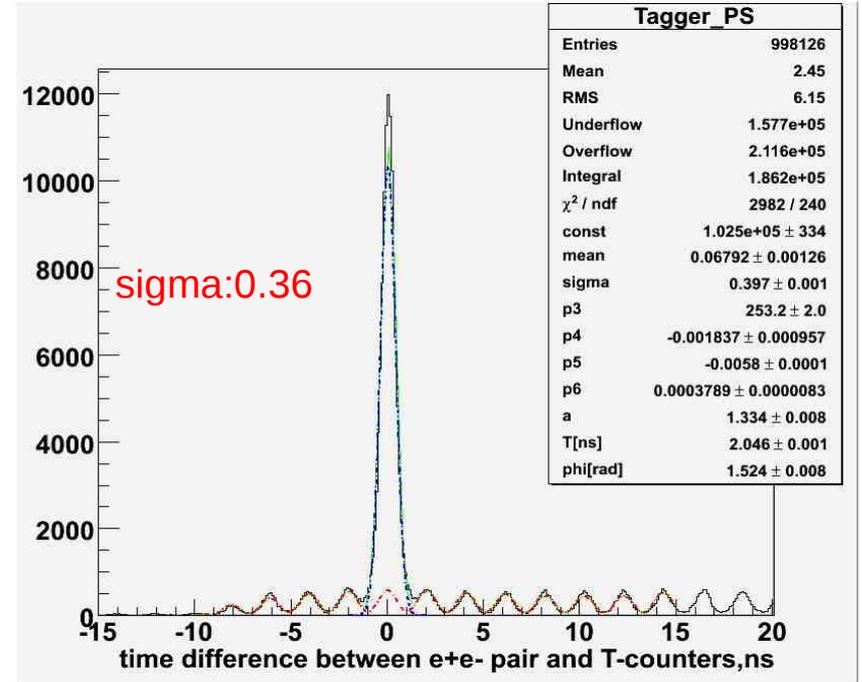
Time of pairs coming from the average time of four
Parts of PS counter

What kind of trigger should be used to analyze relative tagging ratio?

a) Using MOR trigger(no Hycal,clock and LMS) to get the numerator and denominator of R_rel.
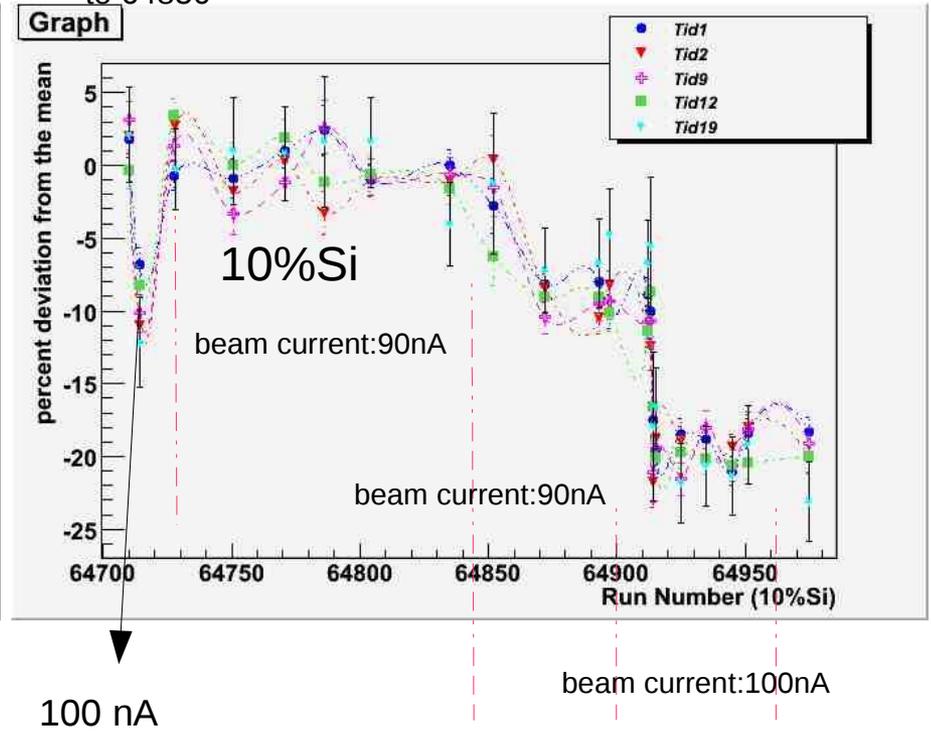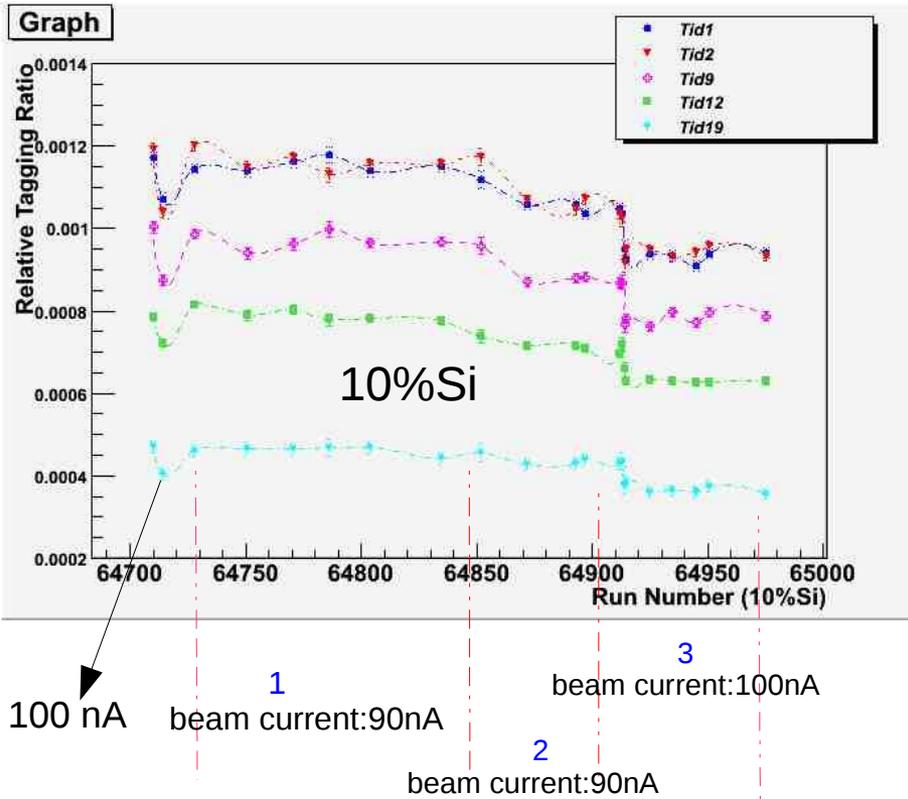
b) Using clock trigger(TAC runs have no clock trigger)

Note: For my previous analyzing, used MOR to get the denominator;

     MOR+PS trigger (no Hycal,clock and LMS) to get numerator

1) R_rel for 10%Si runs by using MOR to get the denominator, MOR+PS trigger (no Hycal,clock and LMS) to get numerator

Relative tagging ratio of Tid1,Tid2,Tid9,Tid12,Tid19 as function of run number of 22 runs spanning all production runs with Si target

Percent deviation from the average mean value as the function of run numbers, and the average mean values were calculated for each T-counters from 7 of 21 runs at the range from 64728 to 64850

100 nA   beam current:90nA

1   beam current:90nA

2   beam current:90nA

3   beam current:100nA

100 nA   beam current:90nA   beam current:90nA   beam current:100nA

1. Run Number(90nA): 64710, 64728, 64751, 64771, 64786, 64804, 64835, 64852
2. Run Number(90nA): 64872, 64893, 64897, 64912, 64913
3. Run Number(100nA):64714, 64914 ,64915,64925,64935,64945,64951,64975,64988

7

2) R_rel for four 10%Si runs by using MOR- Hycal- clock- LMS trigger to get the both numerator and denominator
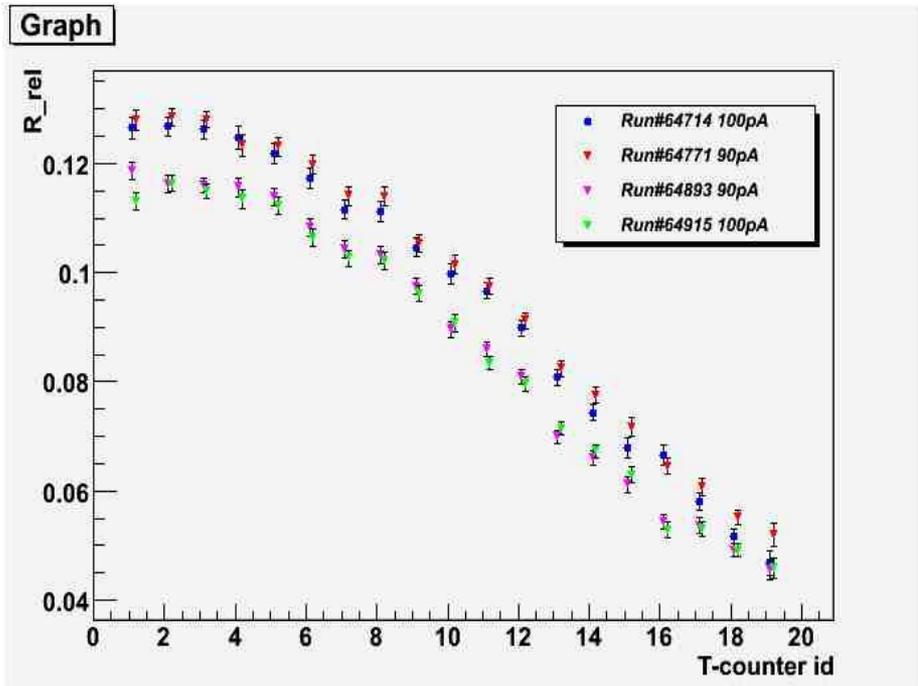
Note: Run# 64714 before region 1
Run# 64771 from the region 1
Run# 64893 from the region 2
Run# 64915 from the region 3

Conclusion:1)compare the run# 64711 in region 1 and run#64714, the drop is caused
by different beam intensity.
 2)compare the run# 64893 in region 2 and run#64915 in region 3 , the drop is also caused by different beam intensity.
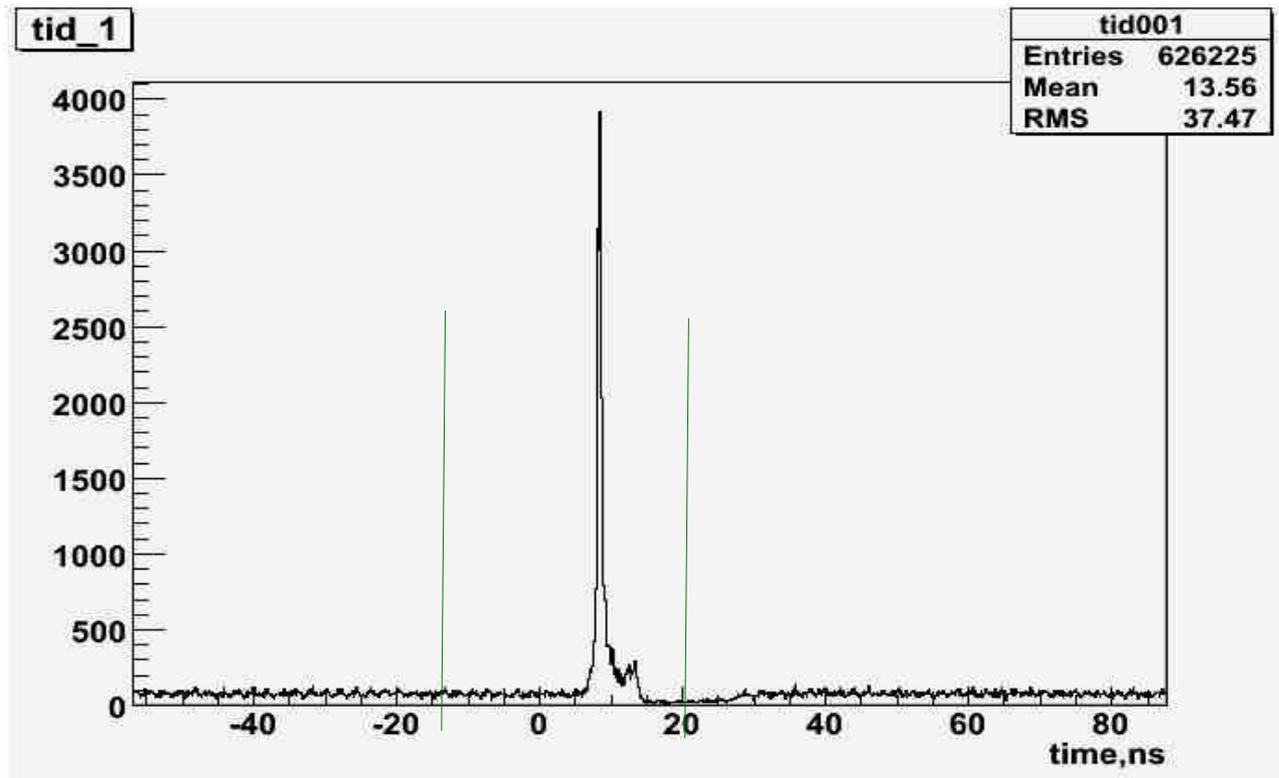3) Can't explain the drop between region 1 and region 2.

4) The R_rel value of each point is bigger than our estimate: about 1.5%

Use cut on the time distribution of e- from T-counter

Time distribution of e- from T-counter#1

MOR-hycal-clock-LMS

Cut window : [-15,20]ns

Side band window: [-30,15]ns&&[20,40]ns