



Accidentals correction

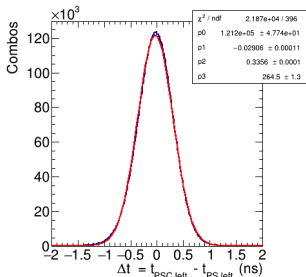
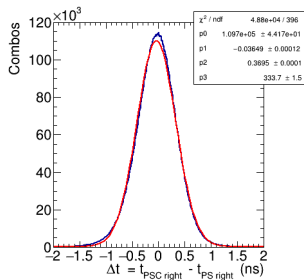
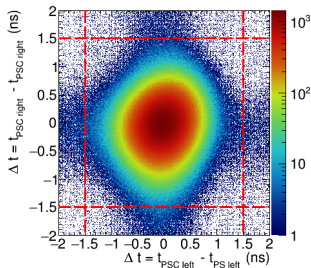
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5/28/2019

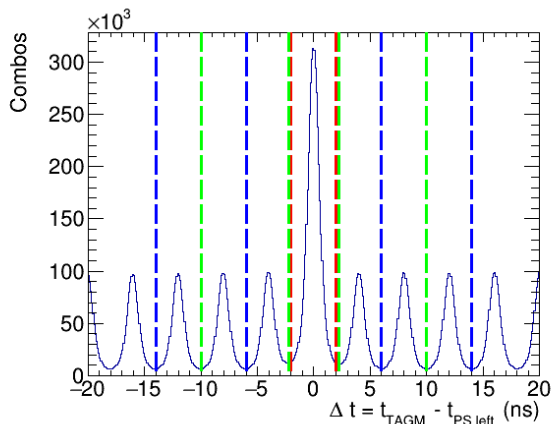
- Completed using TPOL trees, constructed from PS skims.
- Showing work from run 11366.
- Use method 2 from Richard's collaboration presentation.
- Can use TPOL trees to perform method 1 also.

PSC and PS timing coincidence



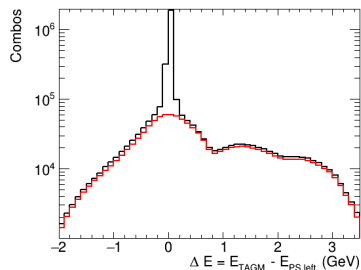
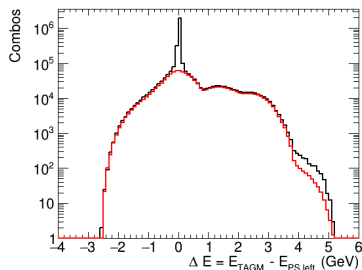
- Timing difference between all combinations of coarse and fine PS.
- Place nominal cuts between -1.5 and 1.5 ns to investigate in time hits.

Prompt and accidental selections



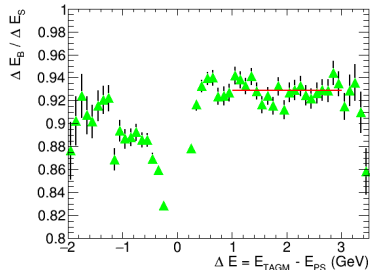
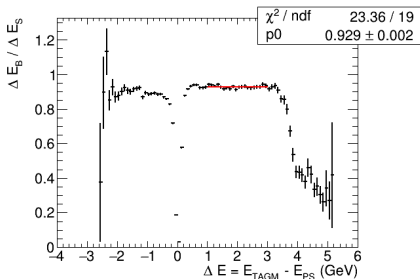
- Selected prompt peak using 2 ns, to be switched to RF time in CCDB.
- Select sets of four accidental peaks, two from each side, from RF time to 25 time RF time. Red prompt peak, green first accidental sets, and blue second accidental sets.

PS and TAGM energy difference



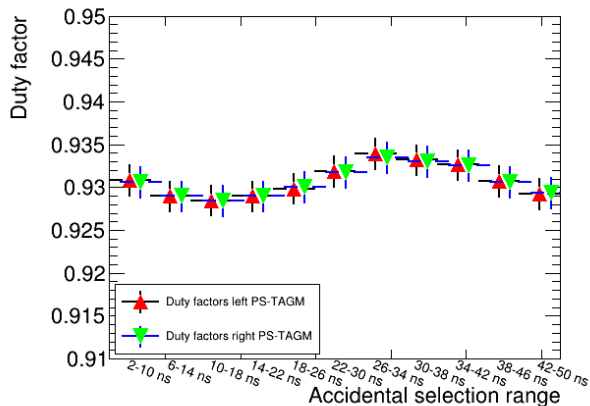
- For unique combinations of PS and TAGM determine energy difference for prompt signal and each set of accidentals.
- Black is from prompt peak and red from blue accidental selection on previous slide.

Energy difference ratios



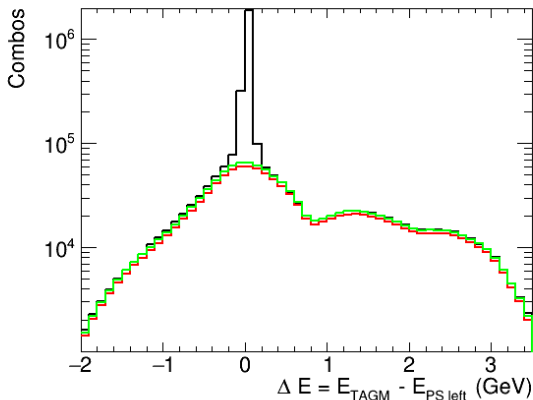
- For each set determine ratio of prompt and accidental energy differences. Showing ratio of prompt with blue accidental selection from slide 4.
- Apply $p0$ fit from 1 to 3 GeV to determine duty factor.

Duty factors



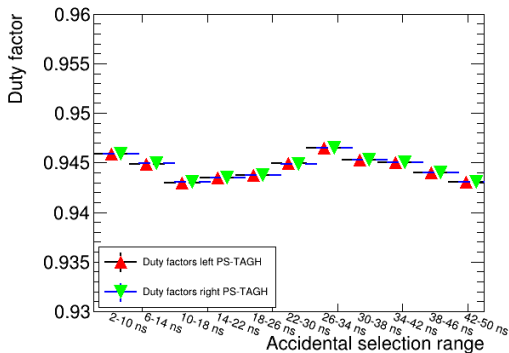
- Plot of duty factors for left (red points with black lines) and right (green points with blue lines) PS-TAGM energy differences for each accidental set.

Accidental correction



- Applied pol0 fit to plots on previous slide. Use this as correction factor for the run.
- Overall duty factor = 0.9307 ± 0.0005

What about TAGH?



- Same effect is seen with TAGH.
- Applied same analysis to find similar duty factor values with pol0 fit from.
- The duty factor is most likely not energy dependent. Needs to be checked.
- Overall duty factor = 0.9445 ± 0.0001

Further questions and work

- Establish systematic of left and right PS-TAGM/TAGH duty factors.
- Does it change admist a run?
- Does it change over a run period?
- Why do we have a difference between TAGM and TAGH?
- Is it polarization orientation dependent? Unlikely, but would lead to possibility of other contribution beyond laser.
- Use alternate PSC-PS time cuts to establish cut based systematic.
- Does this change calibration values in any way?
- Algorithm can be copied to plugin for online monitoring.