

Status report on new mach.bkgr selector

The plan is to establish a new mach bkgr selection procedure able to satisfy the following requirements:

- ☐ the “bkgr event” as a “whole” can be overlapped to the MC event i.e. not using out of time window and then randomly generate flat accidental time distribution.
- ☐ selector rate should be reasonable in order to allow even run by run simulation.

Advantages:

- ✓ correlation DCH,EMC taken into account
- ✓ fluctuations ($\sim 10\%$) between different bunches considered
- ✓ fluctuations along the running time considered

Sample to be used: gg in BHABHA stream

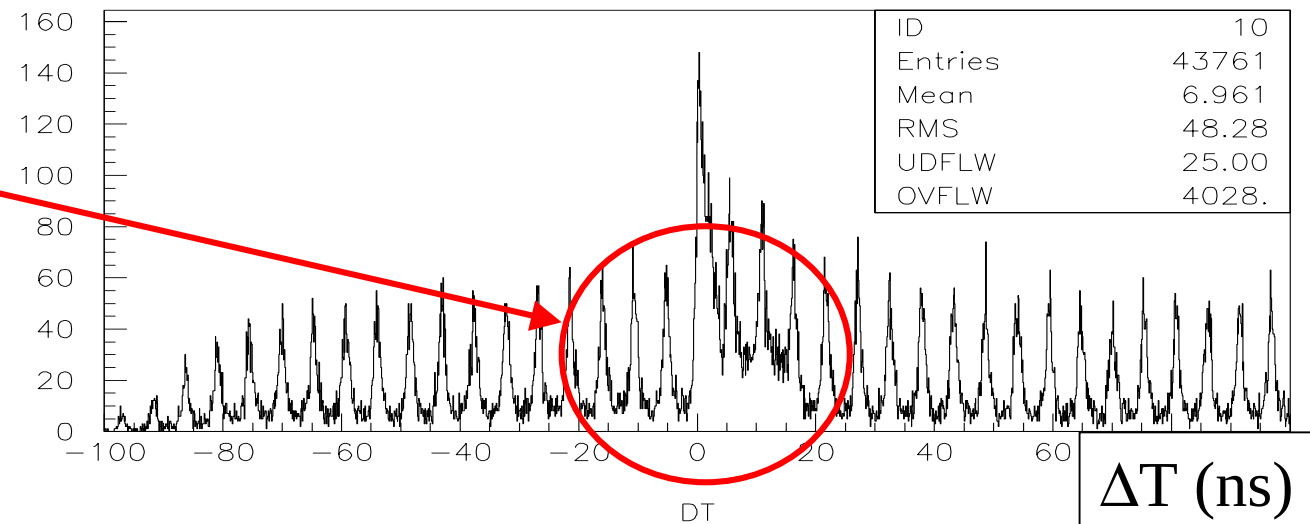
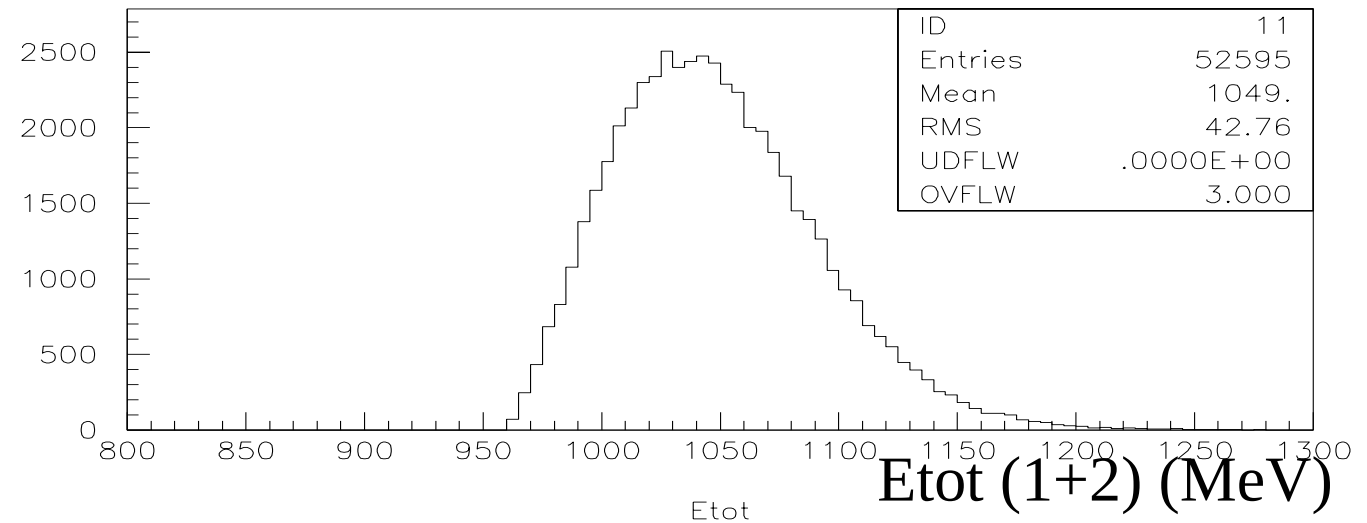
First discovery: DCH selector used L3BHA rejecting calo accidentals

BKG selector (2)

Two clusters in the barrel with:

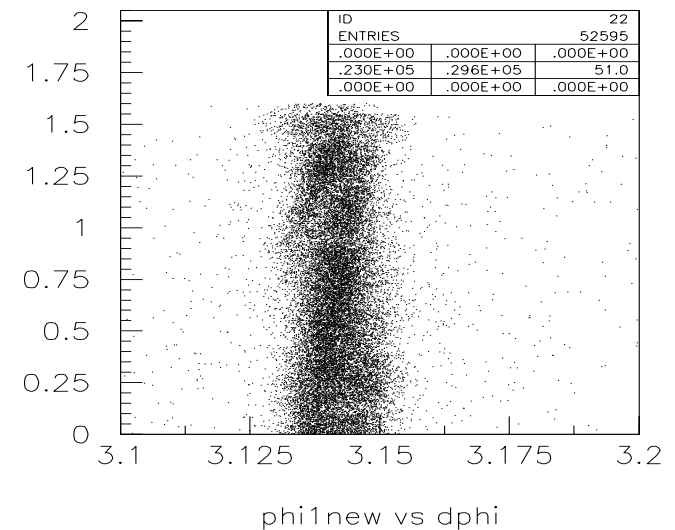
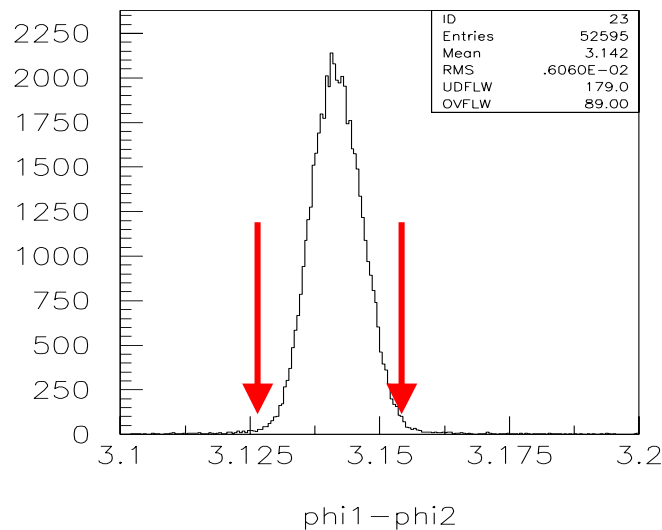
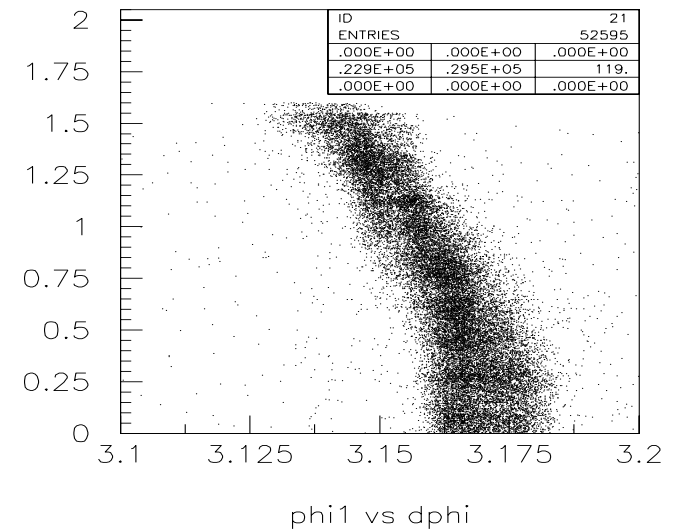
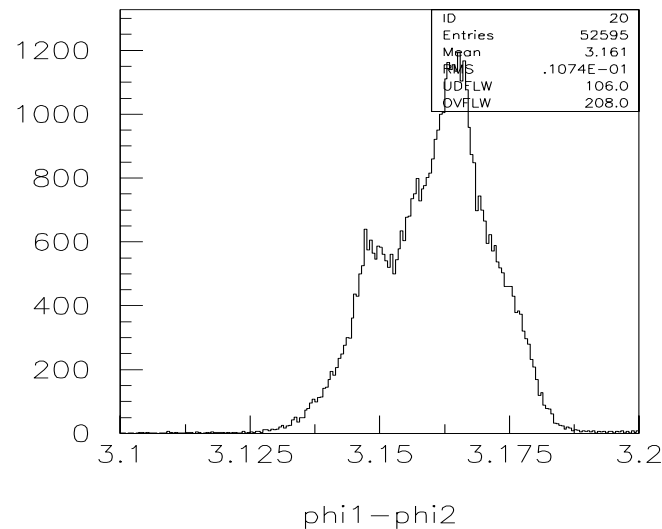
- TW ($5 \sigma_T$, 1 ns)
- $E_{cl} > 480$ MeV
- $E_{tot} > 960$ MeV

Still a lot of mess in the “IN TIME” window



BKG selector (3)

Hardening cuts
requiring very
tight $\Delta\phi$ cut
in Φ meson
c.m.s.

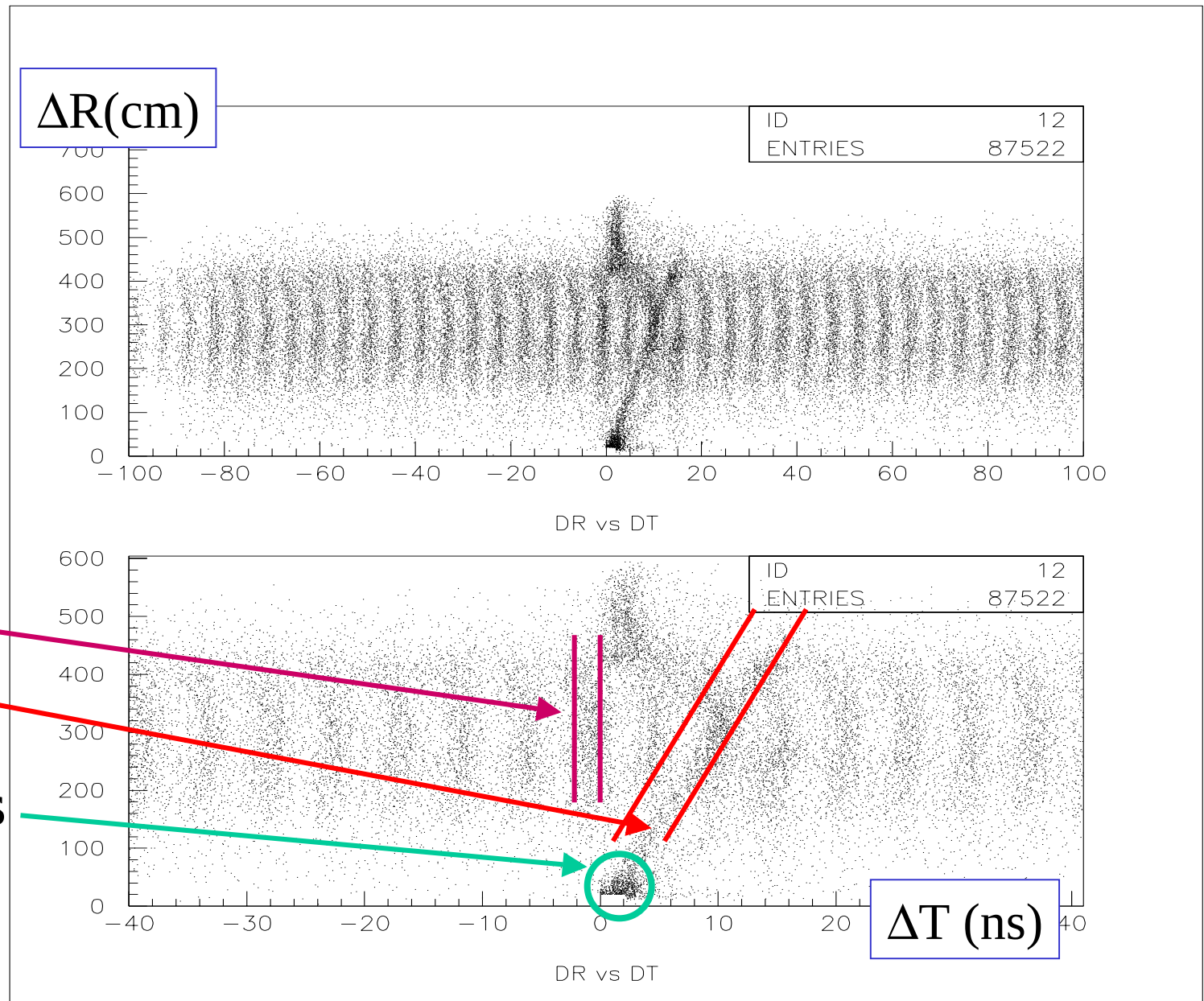


Looking for the “bkgr” clusters

Once “**clean**” clusters have been selected we look for all “**residual**” ones looking at all combinations of DR_{ij} vs DT_{ij} between the “clean” and “residual” clusters.

3 categories

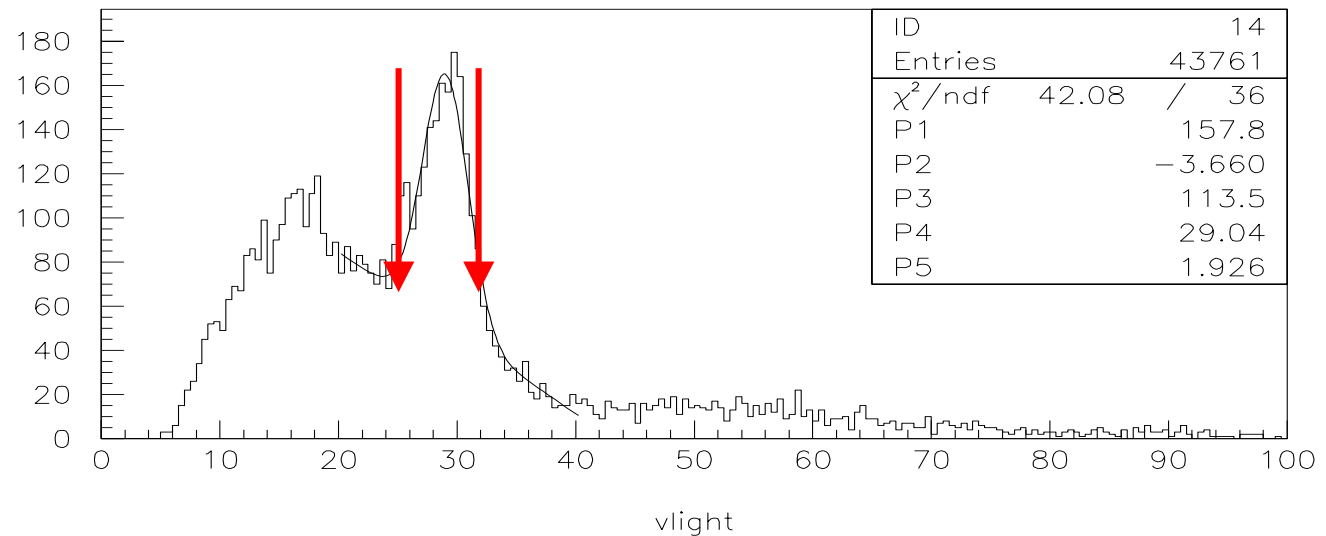
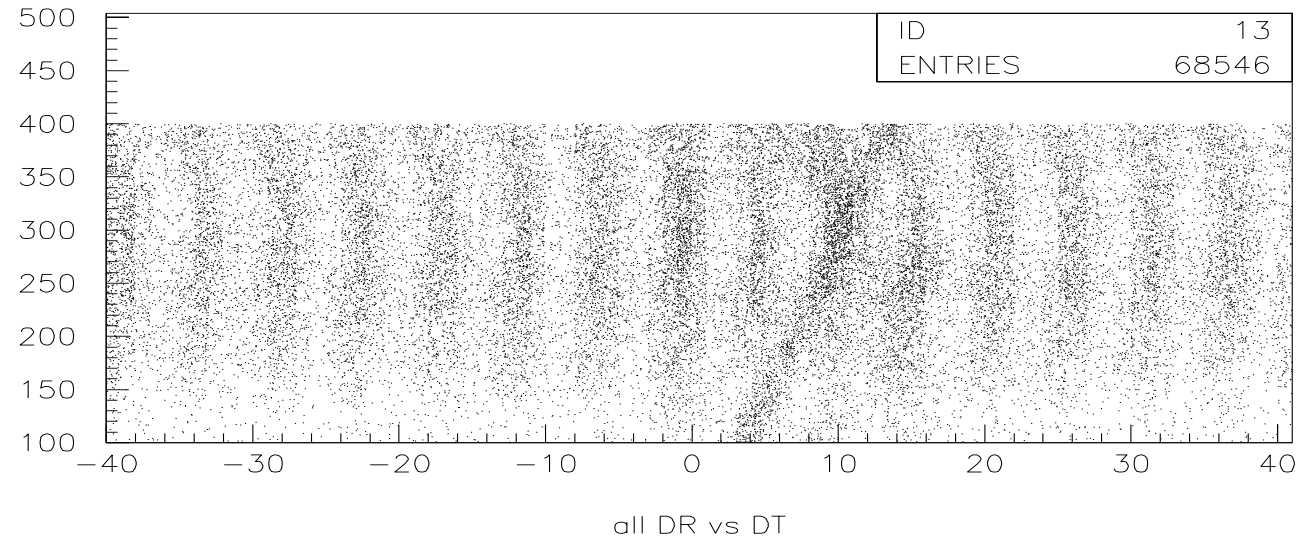
- ☐ $\gamma\gamma(\gamma)$
- ☐ Flying clusters (shower fragments)
- ☐ splitted clusters



Cleaning the bkg clusters

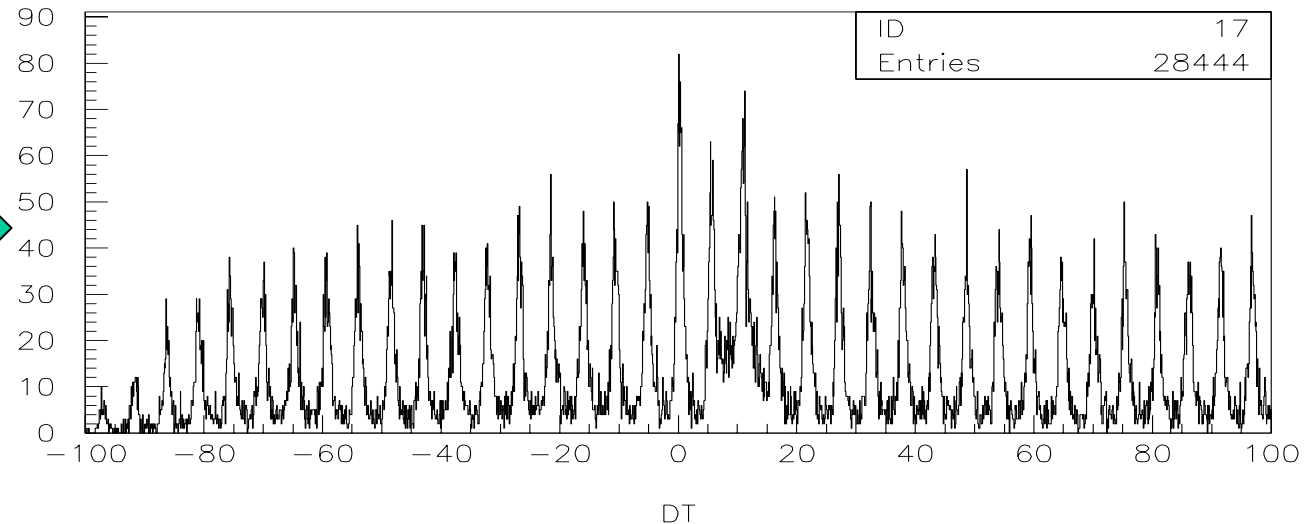
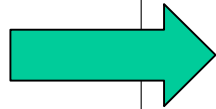
Hardening cuts
on bkg clusters

- ☐ DR1min
- ☐ DR1max
- ☐ Vcut

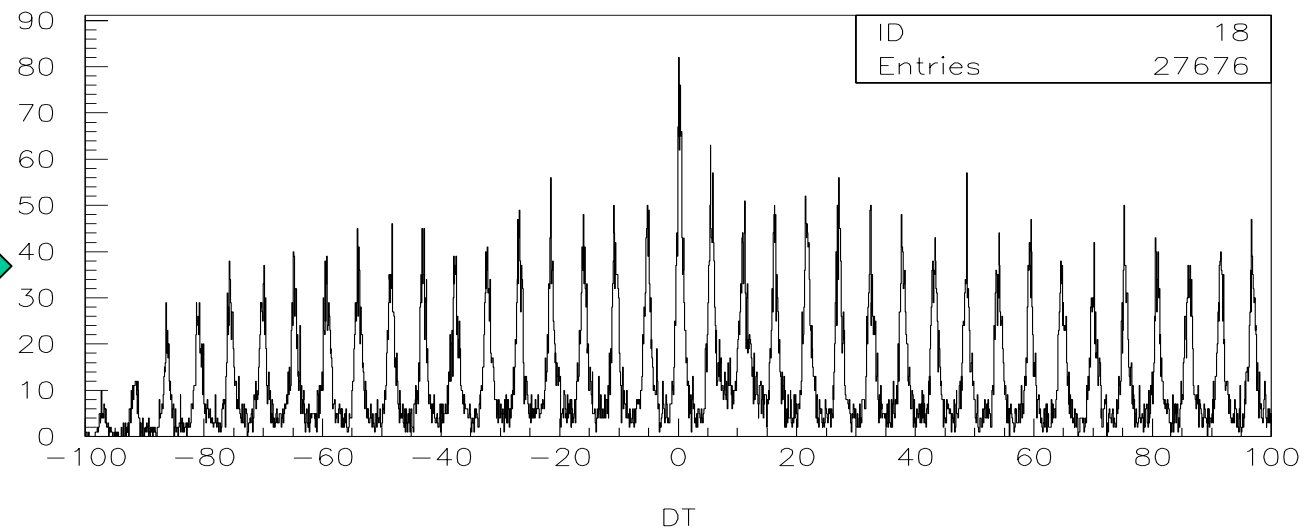
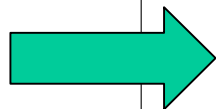


BKG clusters after DR and Vcut

With cut:
 $\Delta R_{\min}$
 $\Delta R_{\max}$

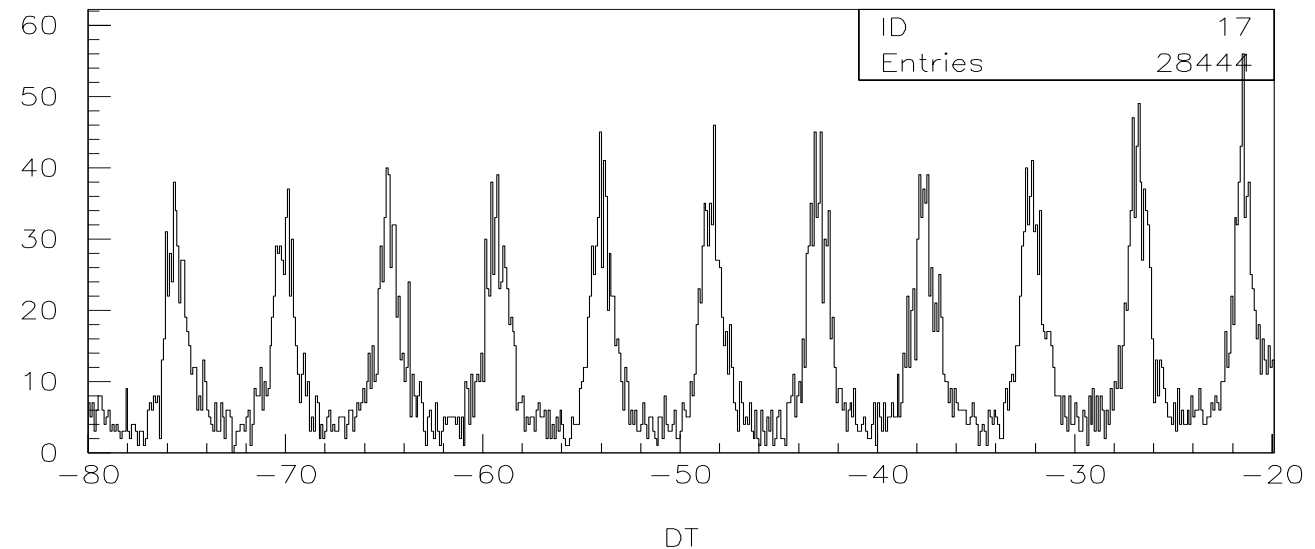


With cut:
 $\Delta R_{\min}$
 $\Delta R_{\max}$
Vcut

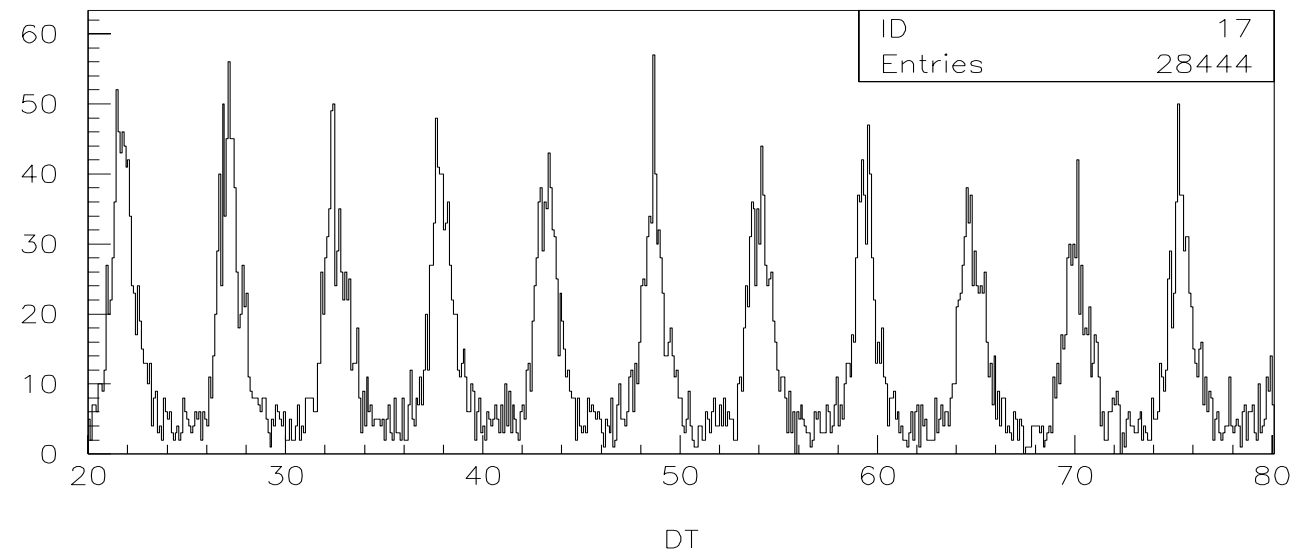


BKG clusters in OUT of time windows

Early Timing

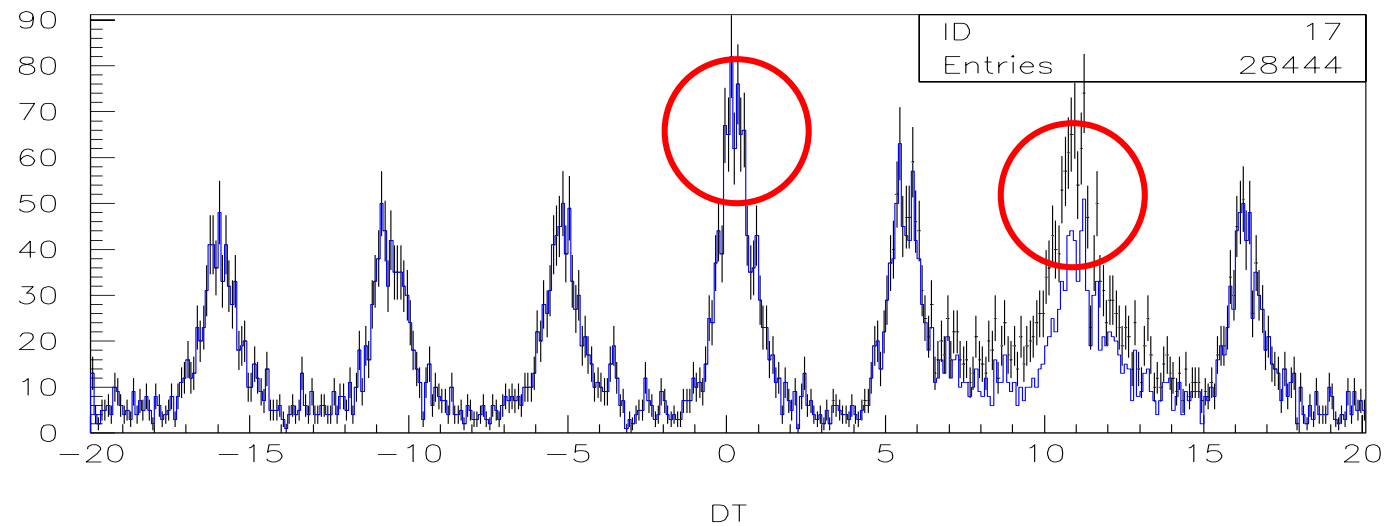
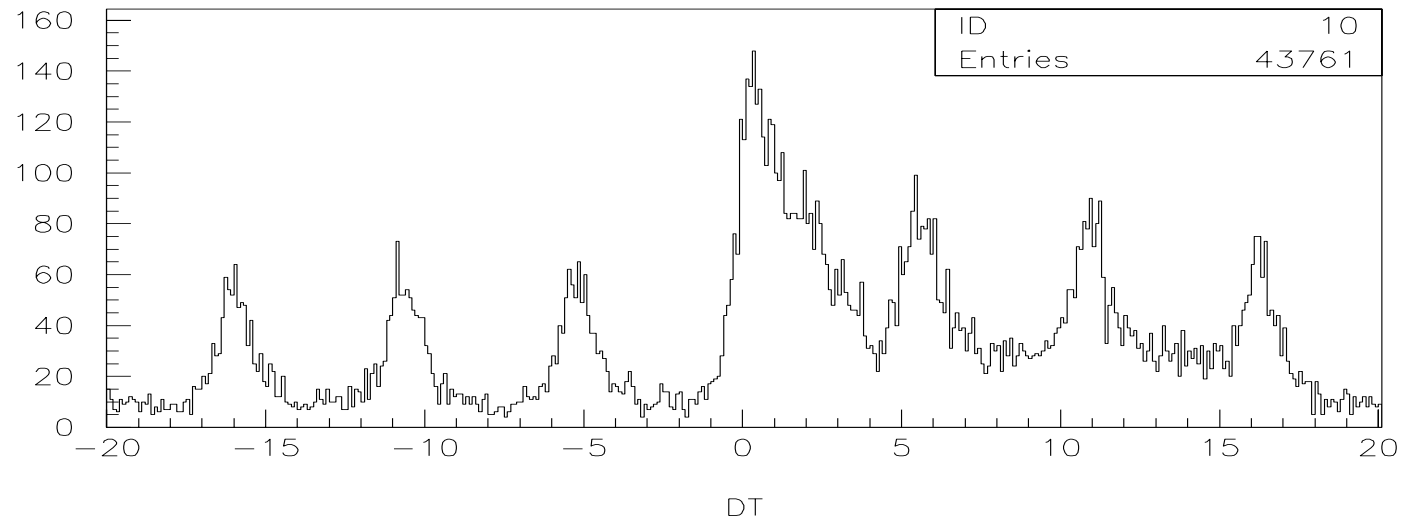


Late timing



BKG clusters before(after) DR & V cuts

Still a few troubles around the IN time window



Conclusions & plans

- ❑ First look reasonable. Still ..
 - hardening cuts also on theta collinearity
 - test energy spectra in region IN-TIME for bkg.clusters
(more cuts or downscaling of events to flatten stat. Composition)
- ❑ Rate looks reasonable
30 ev/ nb-1
- ❑ need to sample roughly **1/20 for KsKl** events
- ❑ Selector code will become a new AC module to be inserted
in a new library MCT?? together with all tech. for event insertion
(see Matt)