Quality analysis for $x_B = 0.36,0.48$ data

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DVCS Collaboration Meeting
JLab

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Outline

- Summary of data control variables
- Conclusions from QA of kin36_1,2,3
- Conclusions from QA of kin48_1,2,3,4 - **F. Georges**
- Examples of Quality analysis results
- Conclusions and outlook

Quality analysis - data control variables

- Beam and triggers
  - Helicity
  - Events per trigger
  - Dead time
  - Accummulated charge/duration of run*
  - Raster synchronisation
  - Beam position
- Spectrometer variables
  - Hits on detectors
    - S2M scintillators
    - Gas Cherenkov
    - Pion rejector
    - VDC planes
- Calorimeter variables
  - Average number of events above a threshold (ARS - integral)
  - Signal arrival times per channel

Quality analysis summary of kin36_1,2,3

I'm looking forward to analyzing this set up to DVCS cross section, anticipating graduation in the Fall of 2017.

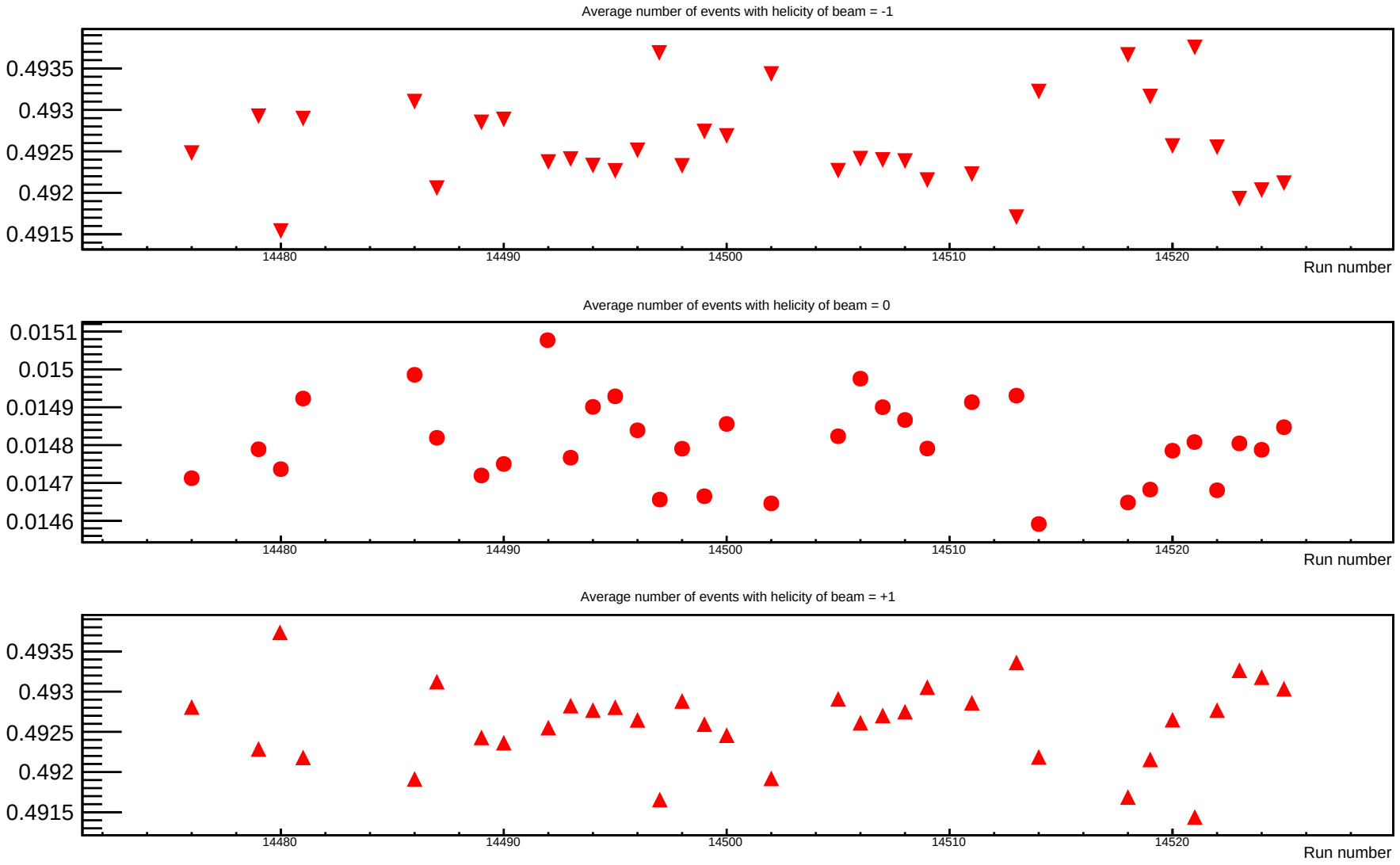
Kin.	**Tot. runs**	**Rejected runs(%)**	**Notes**
36_3	39	8 (20%)	7 - short 1 - CODA crash [14518 - 14521] $\frac{1}{2}$WP was OUT
36_2	65	7 (11%)	2 - no beam 3 - short 2 - ARS alignment issues
36_1	61	2 (3%)	short 10566 - 4 calo channels HV off towards end of run.

Quality analysis summary of kin48_1,2,3,4 - F.Georges

Kin.	Tot. runs	Rejected runs(%)	Notes
48_1	74	8 (10%)	6 - short 2 - No beam
48_2	58	1 (2%)	1 - Calo HV trip 2 - (-) charge, saved
48_3	121	14 (12%)	9 - short 2 - No beam 1 - raster issue 1 - non-existent 1 - CODA crash
48_4	152	13 (9%)	8 - short 2 - raster issue 1 - (-) charge 1 - CODA crash 1 - Compton setup

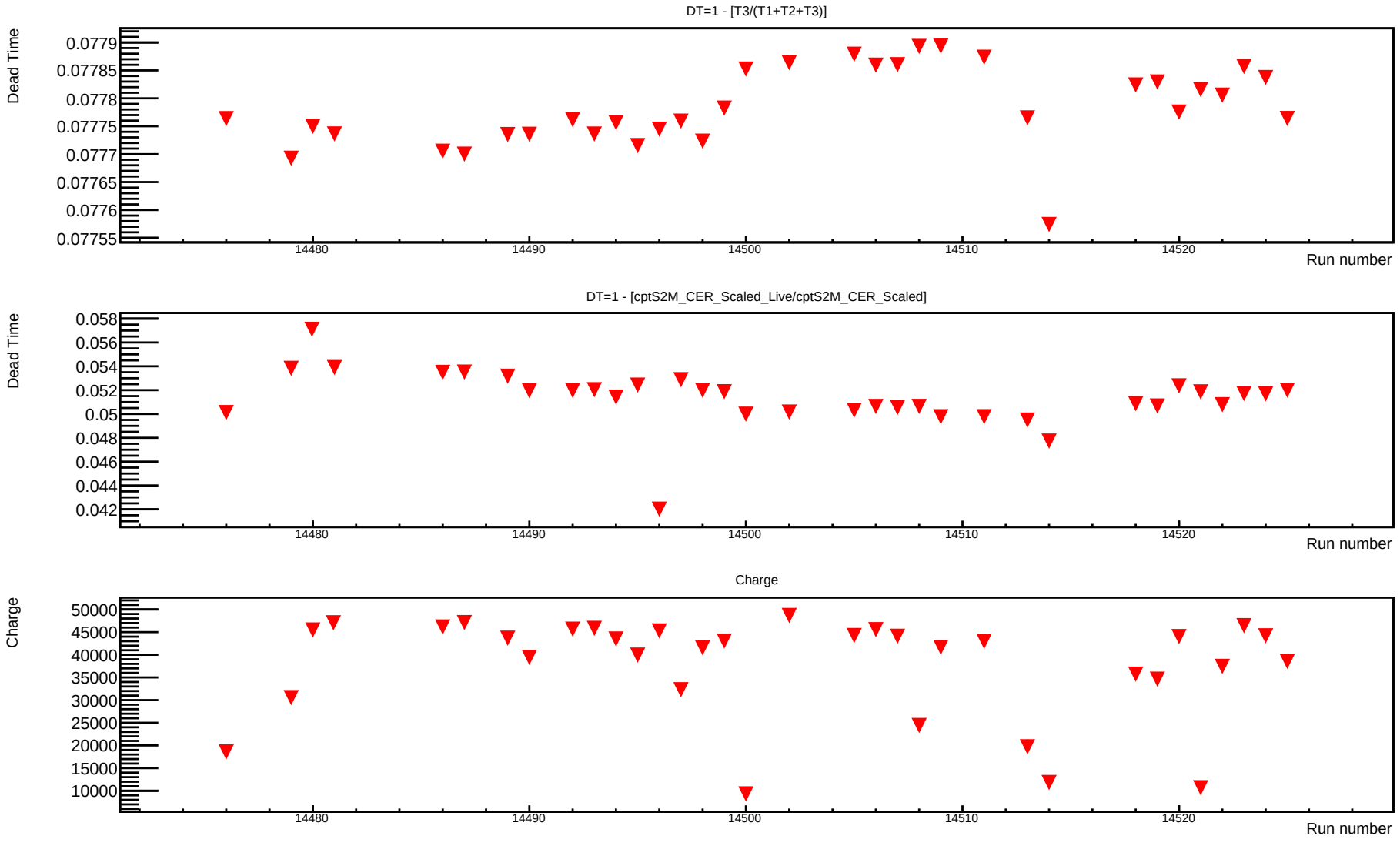
Quality analysis example - kin36_3

- beam helicity check



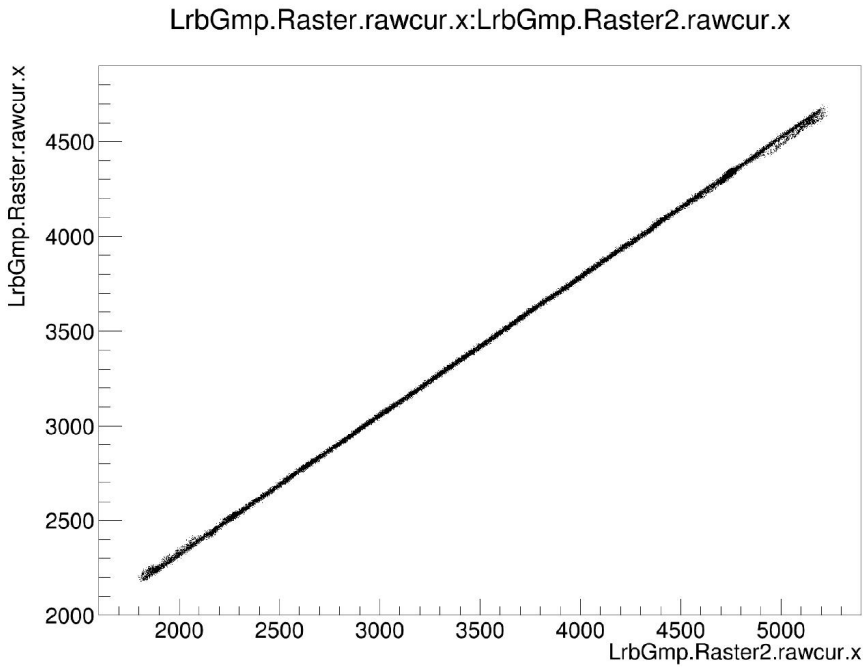
Quality analysis example - kin36_3

- checking deadtime and charge

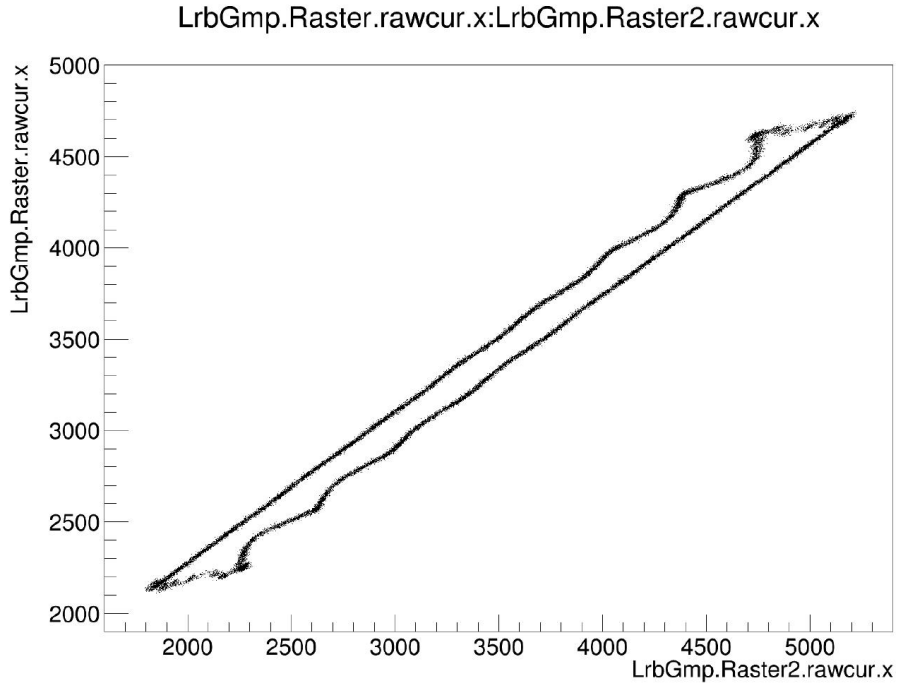


Quality analysis example - kin48_3 (F. Georges)

A well synchronized Raster x current example, run 12950.

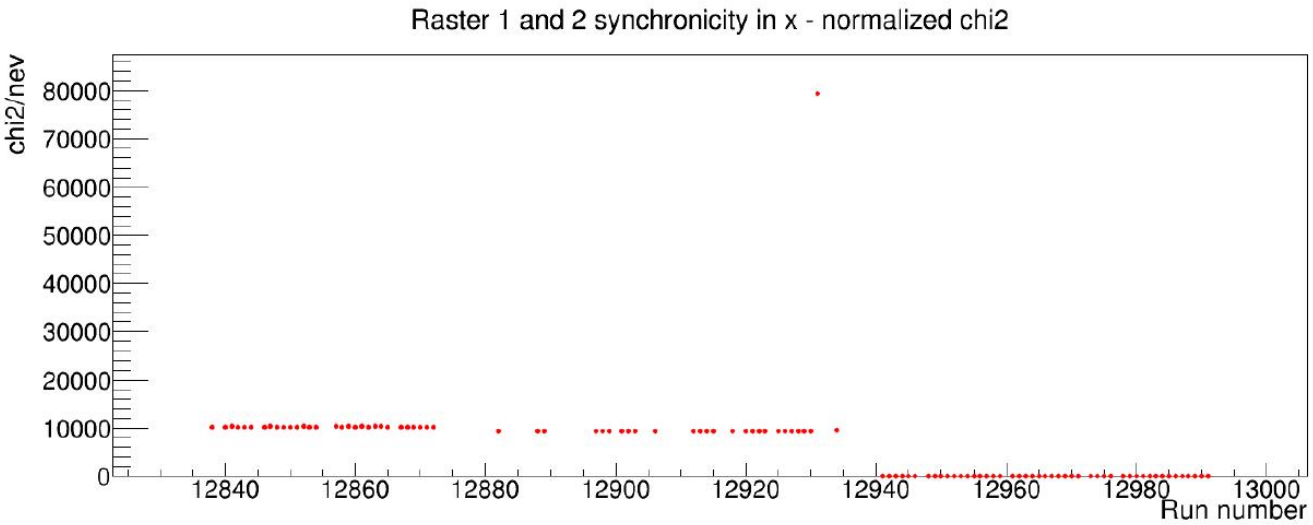


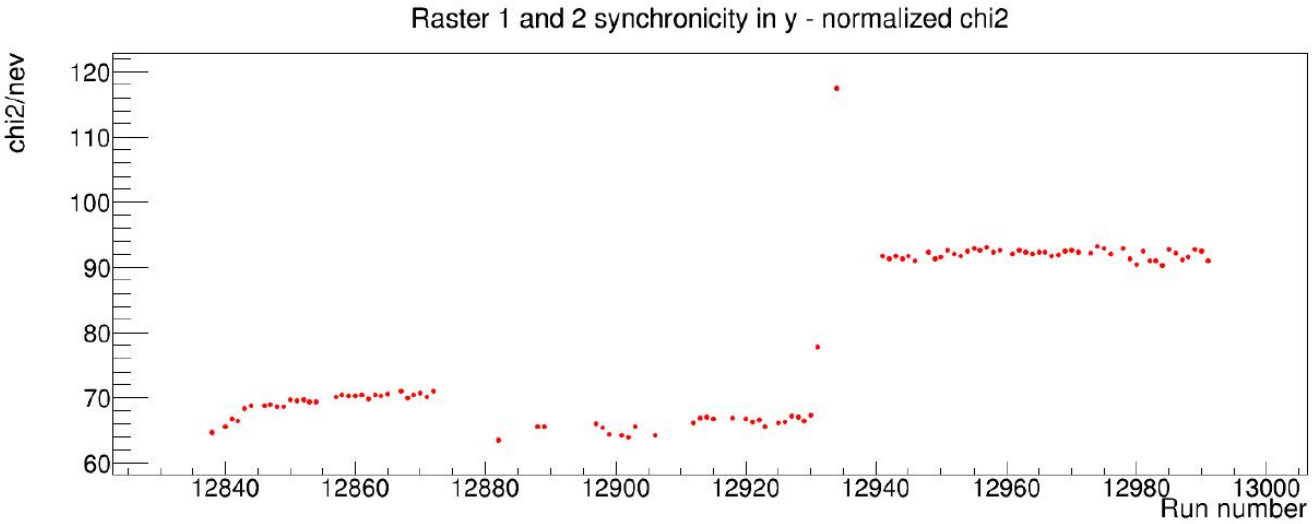
Lost synchronization in Raster x current example, run 12931.



Quality analysis example - kin48_3 (F. Georges)

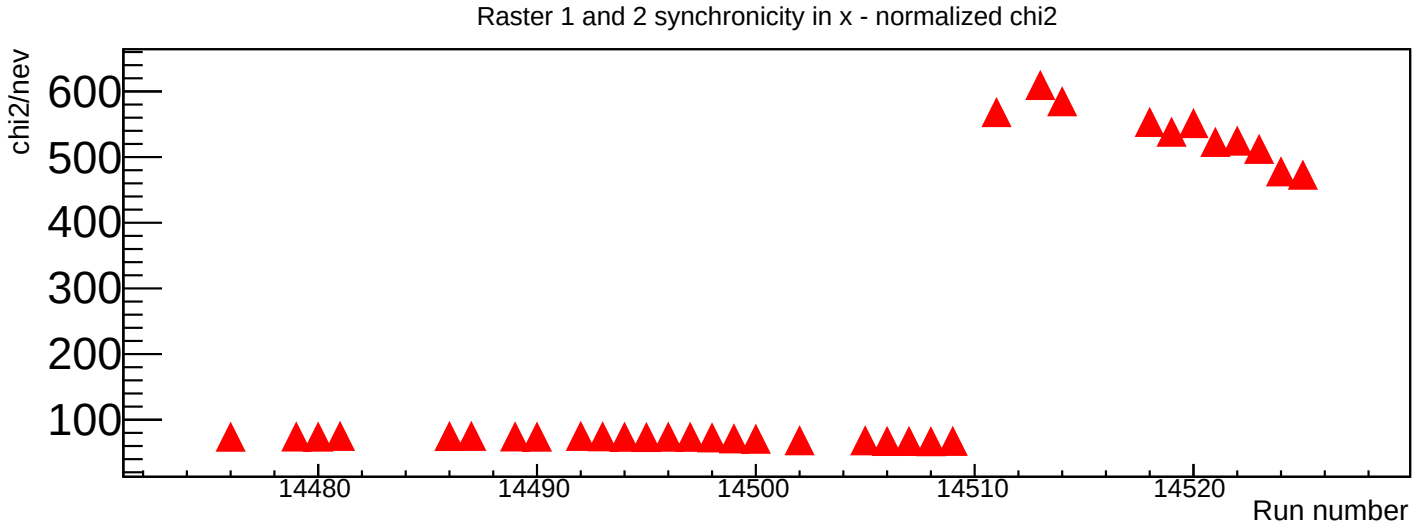
- χ^2 of the linear fit of the synchronized Raster 1 vs Raster 2 currents

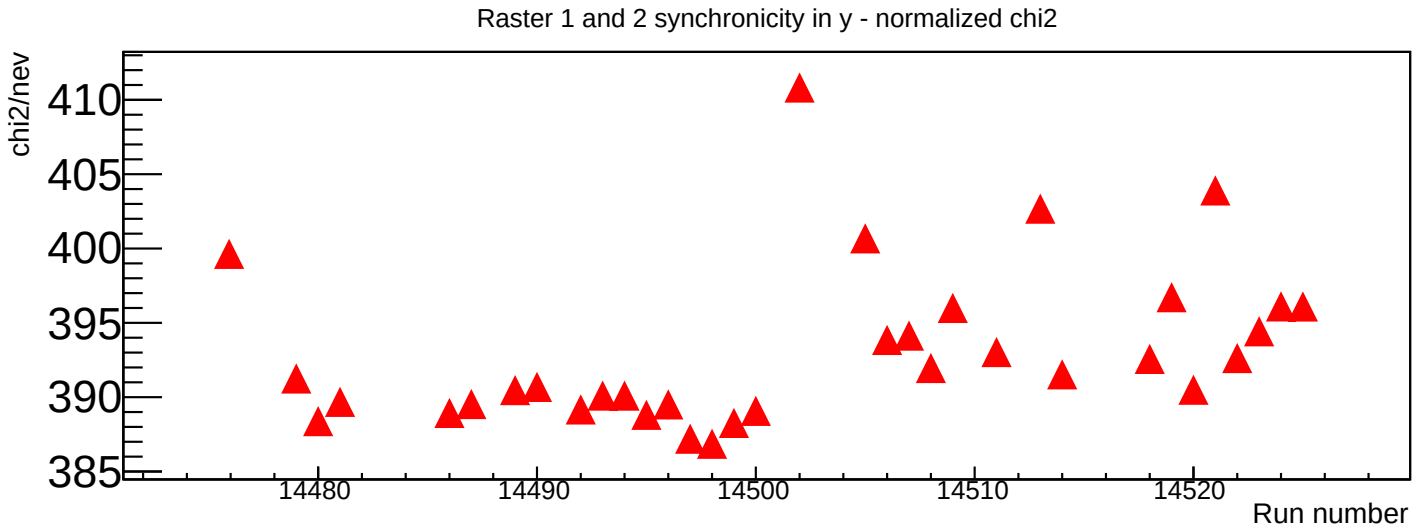




Quality analysis example - kin36_3

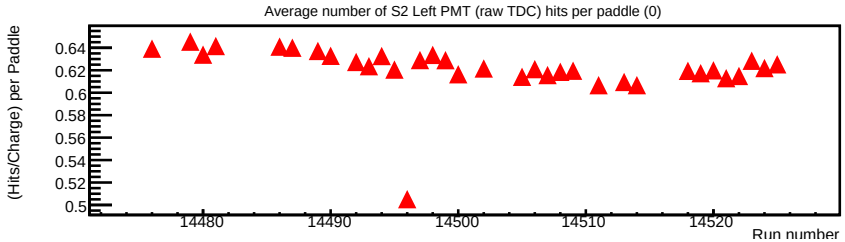
χ^2 of the linear fit of the synchronized Raster 1 vs Raster 2 currents - loss in x after run 14510.

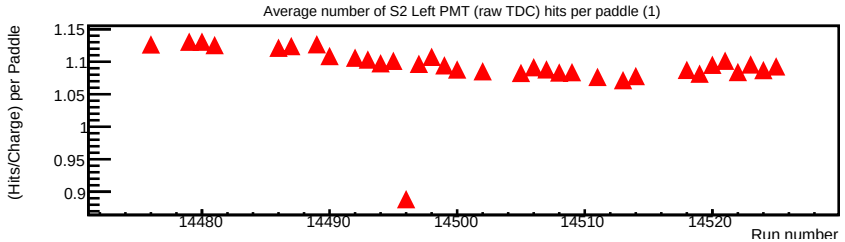


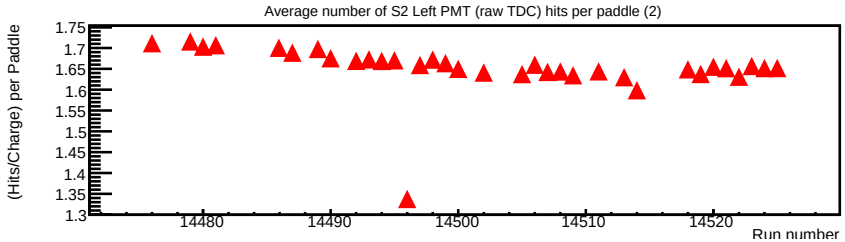


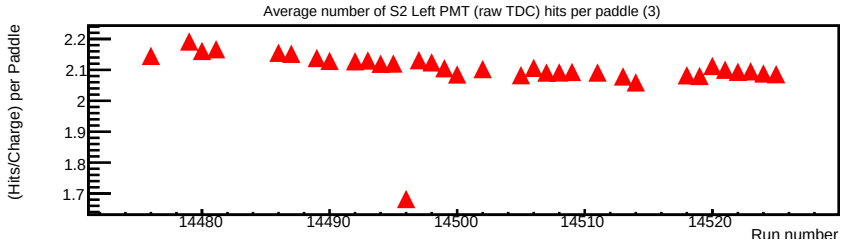
Quality analysis example - kin36_3

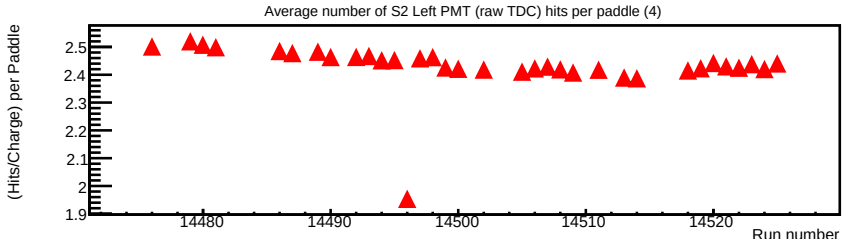
checking the scintillator paddle hits - showing only 8

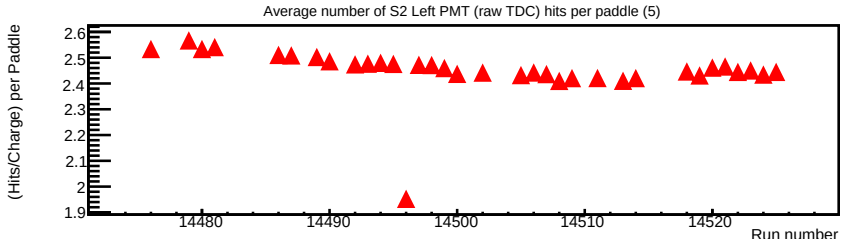


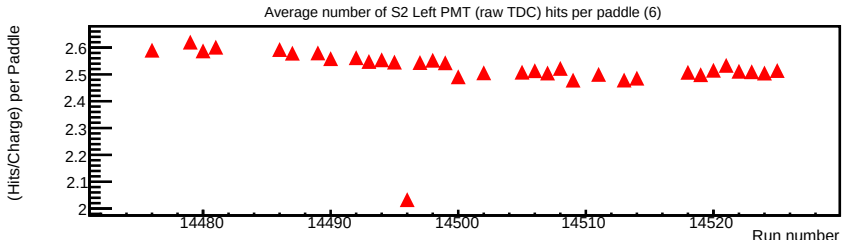


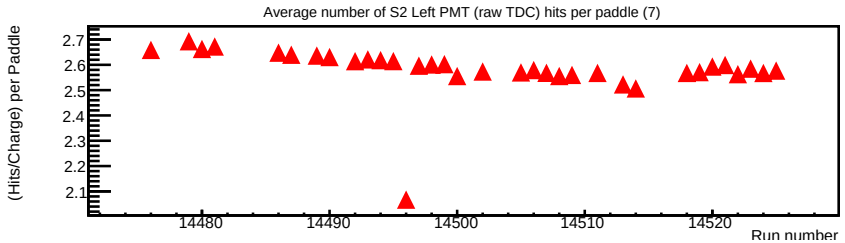






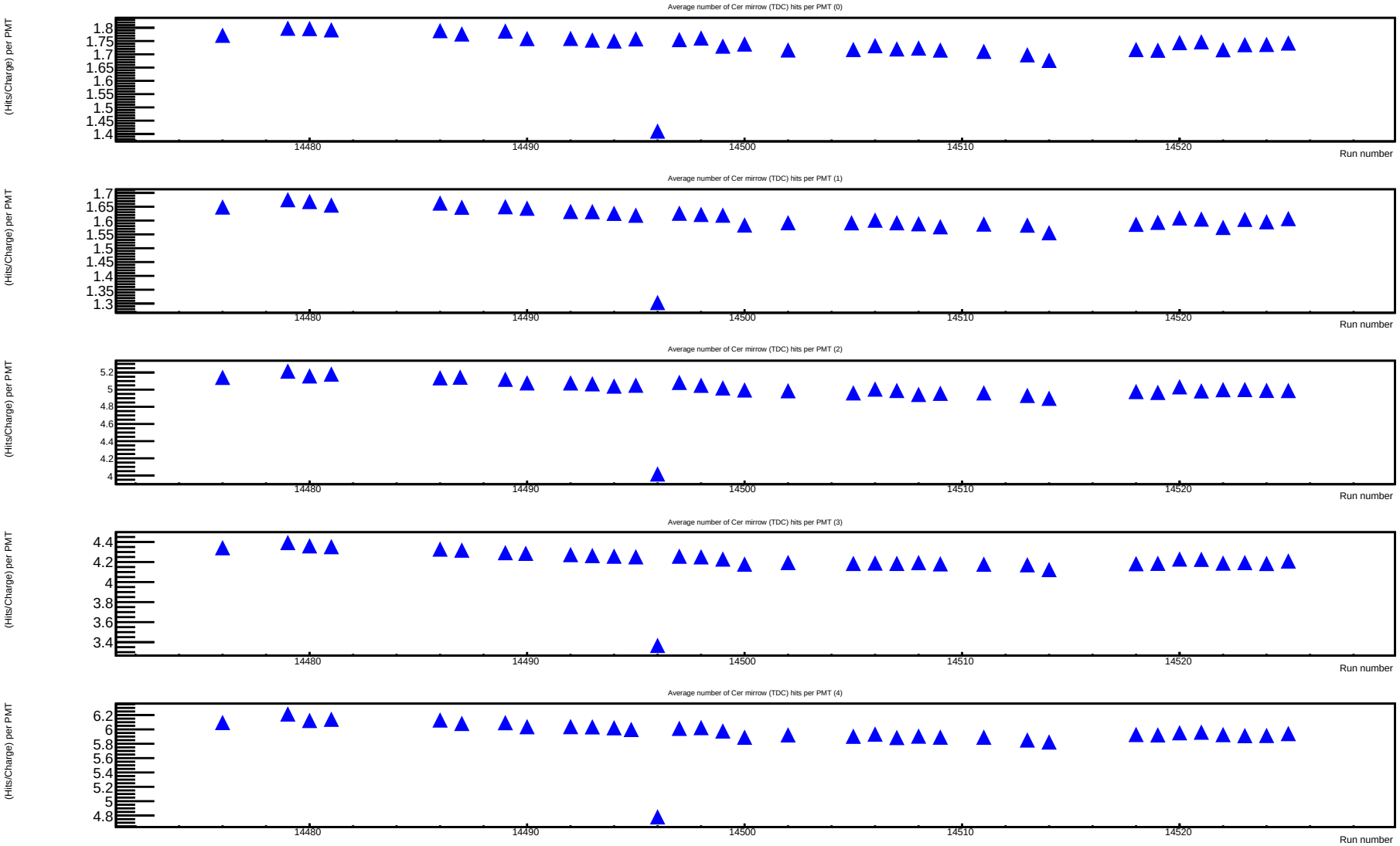






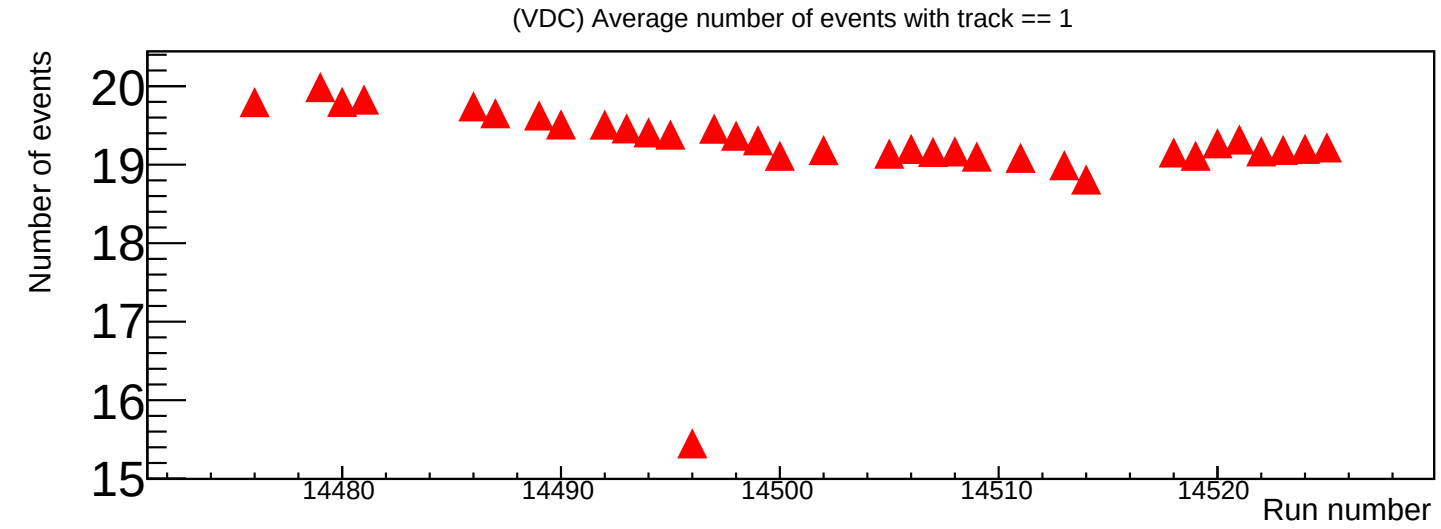
Quality analysis example - kin36_3

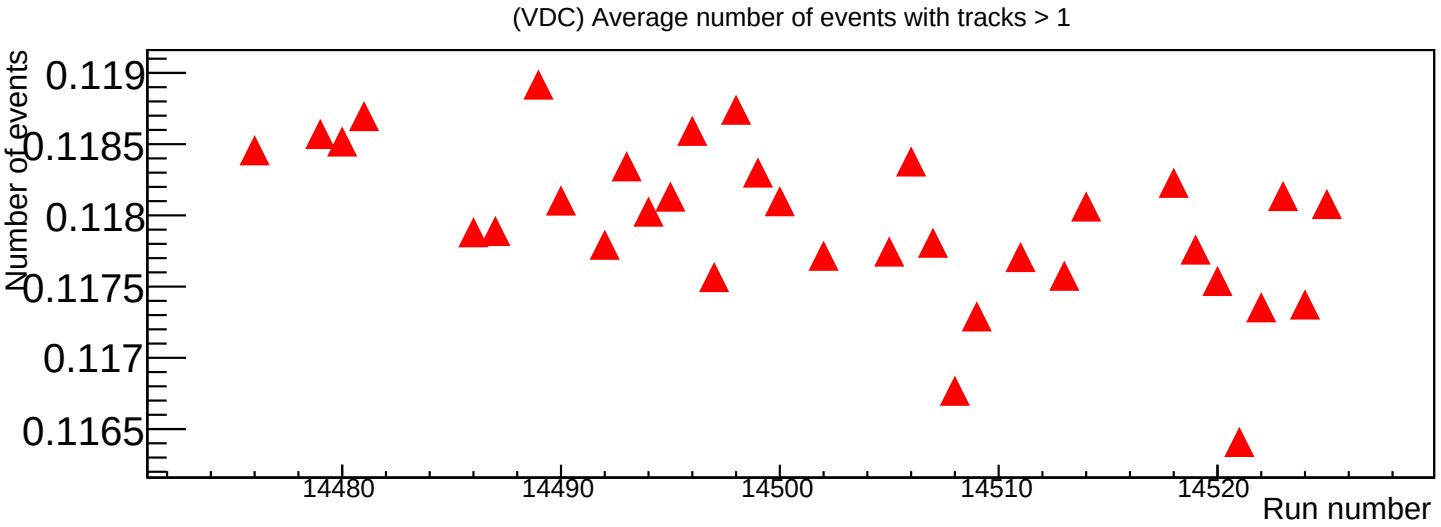
checking hits in Cherenkov - showing only 5 PMTs



Quality analysis example - kin36_3

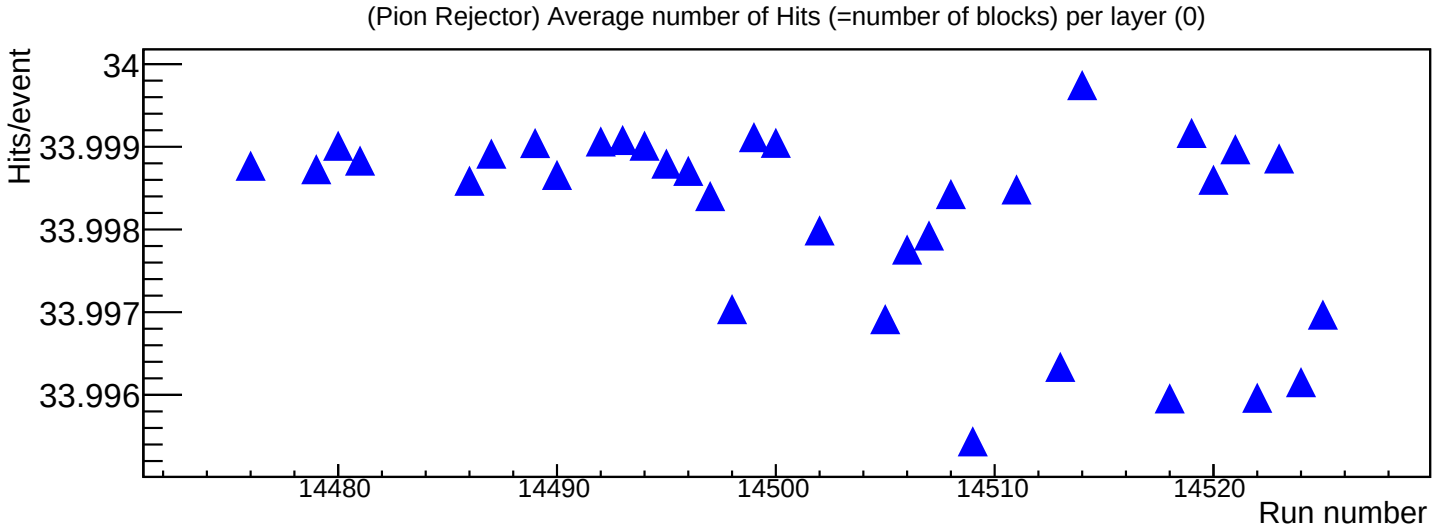
Number of single tracks in VDC (L.tr.n)

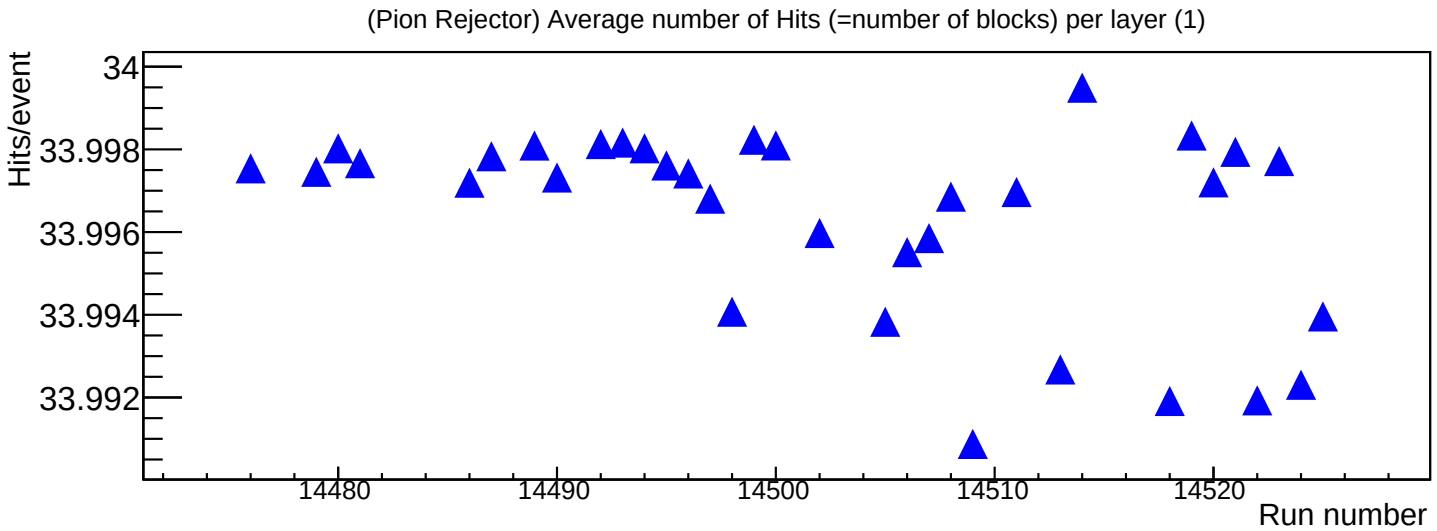




Quality analysis example - kin36_3

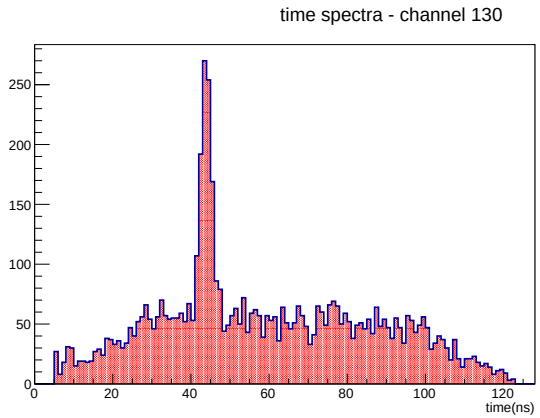
hits on the both layers of the pion rejector

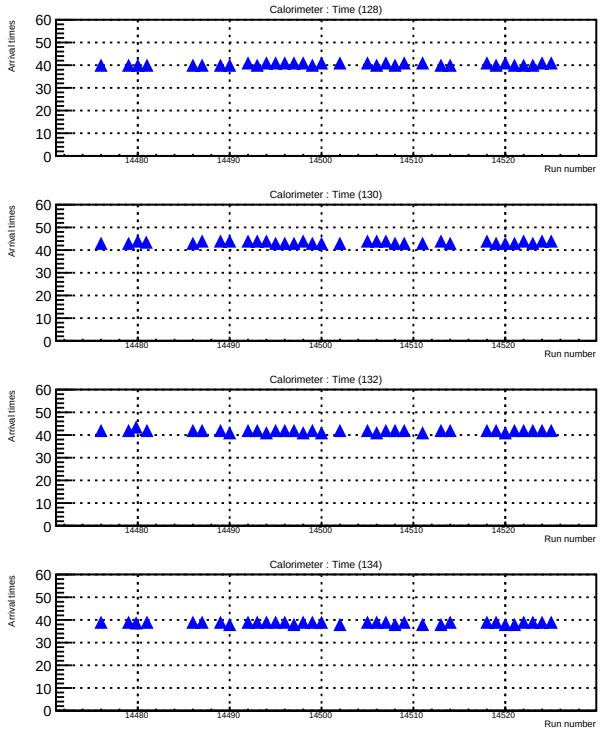


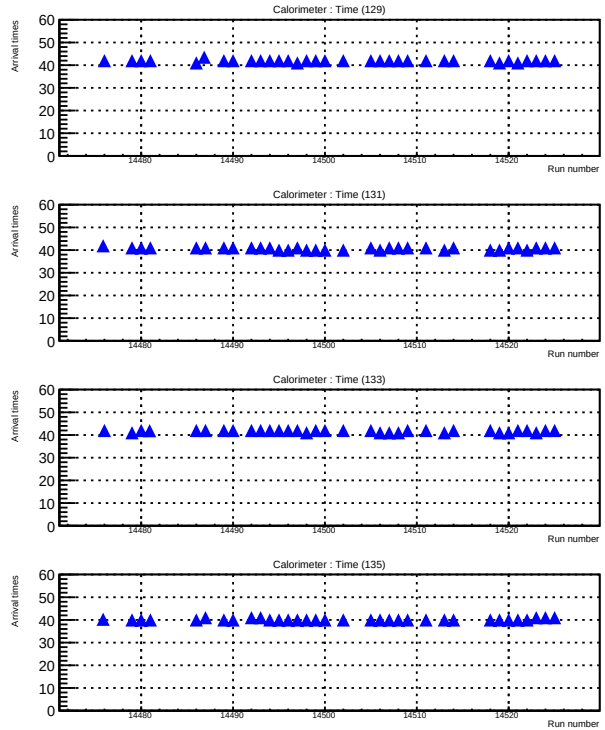


Quality analysis example - kin36_3

A good time spectrum in one channel of calorimeter - difficult when signal/bacground is bad.



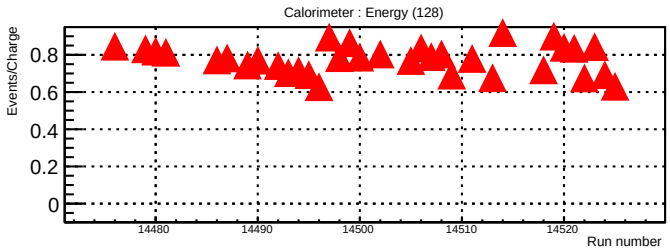


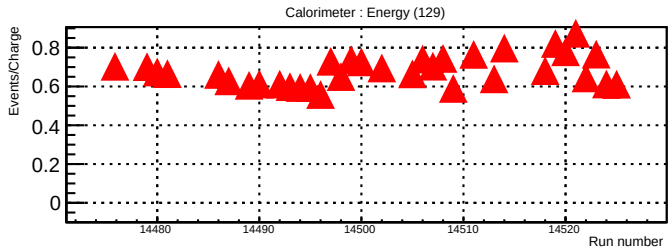


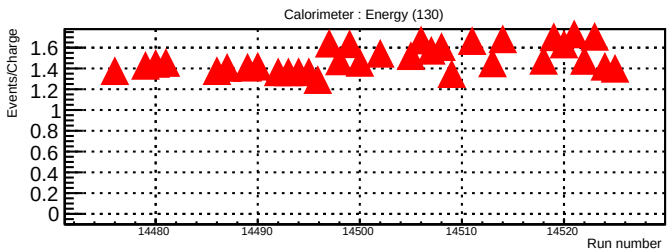
summary of time spectra for a few channels, all runs.

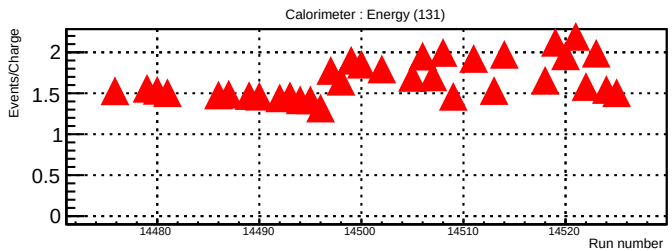
Quality analysis example - kin36_3

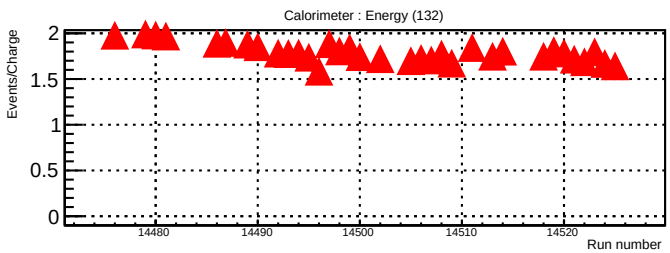
- An example of the normalized ARS integral (above 2000 channels) for a few channels

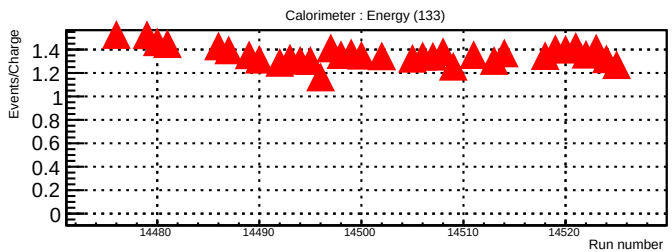


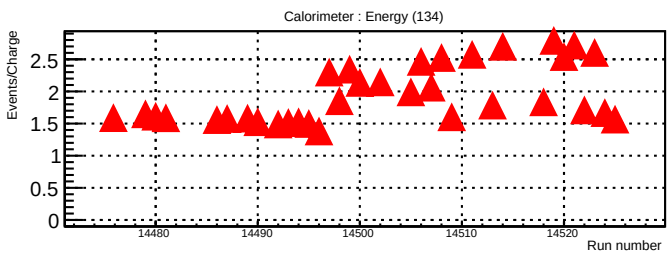


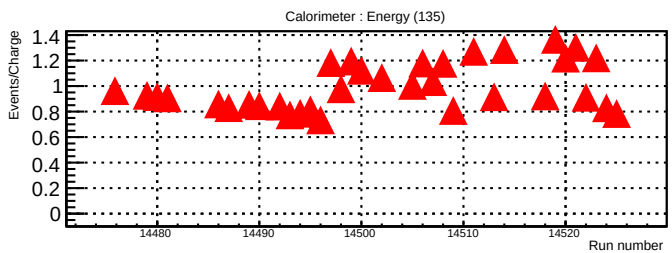












Conclusion and outlook

- Kin36_1,2,3 - Quality analysis done for all kinematics
  - 2 "ARS 9 alignmnet" runs to be redone to see if they can be saved
  - A report will be written and submitted to the ELOG with all the "good" and "not so good" run lists.
- Kin48_1,2,3,4 - Quality analysis done (**F.Georges**) for all kinematics
  - Please see ELOG entries 387 and 390 for the technical note.
- Kin60_1,3
  - Quality analysis has **NOT** been done (yet) for these.
  - These sets have runs where we had the timing loss, Frederic has been working on fixing those runs.

Acknowledgements

- F. Georges
- J. Roche

The End, Thank you