Replies to RGC-summer2022 pass1 review recommendations

RECOMMENDATIONS: A list of problematic runs with known issues should compiled and the information book kept in a DB to warn physics analyses. While the effect of the Hall-C beam bleed through is visible in some monitored quantities (e.g. ECal start time), and to some extent could be corrected during the analysis, the implications for other variables and effects on measured physics observable are not clear. For instance, how would it affect the background merging necessary to compare simulation to data? A study about a mitigation procedure and a strategy to quote a reliable systematic error for runs affected by this issue, or a procedure to exclude problematic runs from the analyses should be defined. Jumps in the FC QA timelines should be understood and a possible mitigation strategy for consequences in charge normalization and beam-charge asymmetry should be defined.

List of problematic runs

List of problematic/special runs for RGC Summer2022 for which some detectors are out of specs in the calibration timelines:

- 16043 (2.2 GeV) Lumi scan test, Empty Target, $10 \rightarrow 15$ nA
- 16096-16103: lumi scan, 1 nA $\rightarrow$ 4 nA
- 16186 Empty Target, no LHe, no raster
- 16306: Empty target run, beam blocker moved in and out during the run, must be discarded as FC not reliable
- 16396-16400: trigger tests
- 16454 no CND TDC https://logbooks.jlab.org/entry/4020714
- 16580, 16581, 16583: no S3 https://logbooks.jlab.org/entry/4024903
- 16627, 16634, 16658, 16659, 16664, 16666, 16671, 16673, 16675, 16678, 16692: Hall C
  bleedthrough: https://logbooks.jlab.org/entry/4029139 https://logbooks.jlab.org/entry/4028180 Run16627 is the most strongly affected.

Runs for which FTCal could not be properly calibrated, but the other subsystems are ok:

- All the 2.2-GeV runs: 16042 – 16078
- 16089: Empty Target run used for raster calibration
- 16271: small ND3 (5M events) run with many long beam trips (2 hours long) and overall unstable beam conditions.
- 16273: ND3 run used for raster optimization
- 16277, 16279: prod runs after ND3 target irradiation
- 16396 – 16403: prod runs after ND3 target irradiation (16396 to 16400 are trigger tests)

The runlists on the RGC wiki (https://clasweb.jlab.org/wiki/index.php/RGC_data#Good_runs_lists) have been updated accordingly:

https://clasweb.jlab.org/wiki/images/8/86/Runlist_2.2GeV_final.pdf

https://clasweb.jlab.org/wiki/images/3/37/Runlist_FTon_summer2022_10.5GeV_final2.pdf

Study of all « jumps » in FC-normalized yield from QA timeline

Number of Trigger Electrons N / Faraday Cup Charge F

- 16096-16103: C target, lumi scan 1 nA → 4 nA
- 16105-16122: C target, Raster studies

- 16290-16293: C
- 16298-16303: CH3

16262-16289: ND3 (first 5 runs are raster tests)

16137-16178: NH3

16658-16695: NH3 Bleedthrough in first runs

16211-16260: NH3 new trigger

16361-16636: ND3 Trigger tests in first runs Bleedthrough at runs 16627 and 16634

16317-16359: NH3 new trigger

16709-16772: NH3
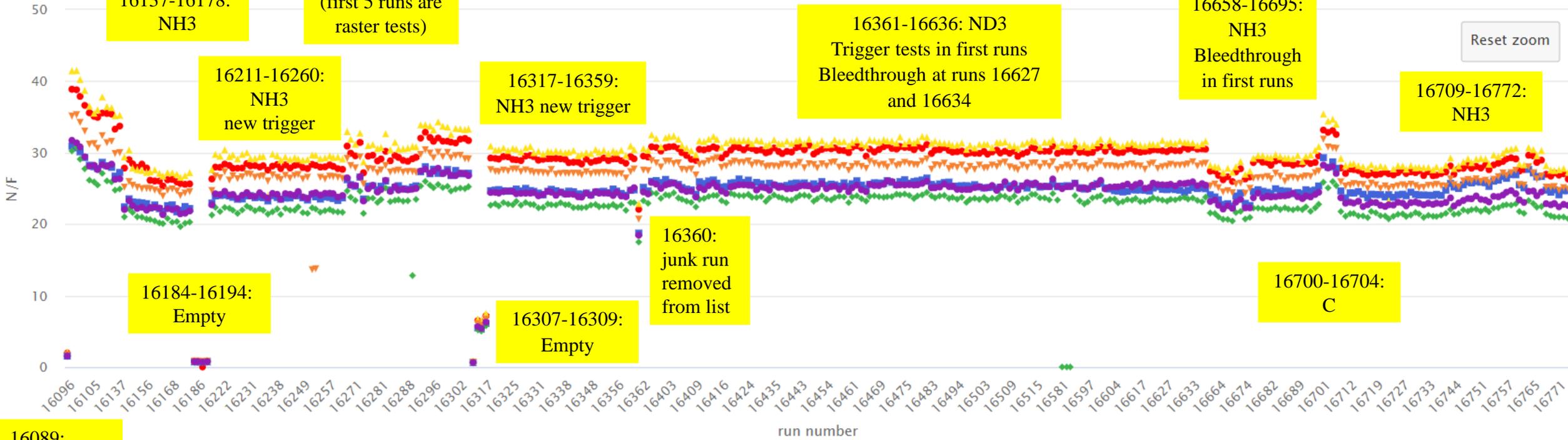
16184-16194: Empty

16360: junk run removed from list

16700-16704: C

16089: ET run used for raster calibration

16307-16309: Empty

16306: ET run, beam blocker moved in and out during the run, FC not reliable

Higher trigger rate in 16753-16766 probably due to variations at the target level
https://logbooks.jlab.org/entry/4033869

Legend: A_sector_1, A_sector_2, A_sector_3, A_sector_4, A_sector_5, A_sector_6

Zoom in the region of runs for which bleedthrough was observed

Number of Trigger Electrons N / Faraday Cup Charge F
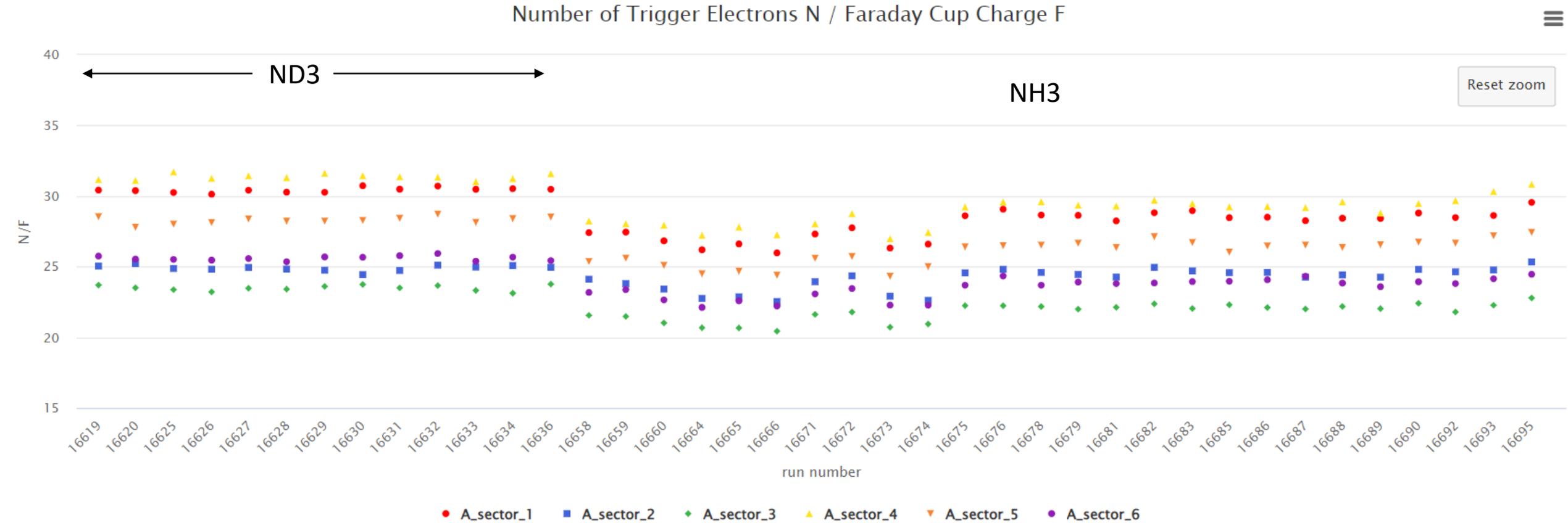
Bleedthrough observed in runs: 16627, 16634, 16658, 16659, 16664, 16666, 16671, 16673, 16675, 16678, 16692

These timelines are made with 10 files/run. The fully-cooked runs will be necessary to study the impact of bleedthrough