



Report

Readiness Review for pass1 processing of the HalIB/CLAS12 RG-B Fall 2019 data set

Friday, November 9, 2020

Review committee:

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The review for the readiness of RG-B to process the fall 2019 data set took place on November 6, 2020, remotely over *bluejeans*. For the meeting agenda and the presentations please refer to the review page:

https://clasweb.jlab.org/wiki/index.php/Run_Group_B#Pass-1_review_.28Fall.29

This data set is the second from the run group that will be processed to provide more statistics for the ongoing analysis. We should note that this will not be the final processing of this data set. The final round of data processing can happen after the software and alignment improvements (ongoing) will be ready.

The review committee thanks the RG-B team for preparing the presentations, providing ancillary information, and patiently answering our questions during the review. Below are our answers to the Review Charge questions and some comments and recommendations. RG-B has done a great job with calibrations and understanding the data set and can proceed with the processing of data after addressing the two recommendations.

Review Charge:

Charge #1: *Is the quality of detector calibration and alignment adequate to achieve the performance specifications foreseen for CLAS12 or achievable at the current time, given the "state of the art" calibration, alignment and reconstruction algorithms?*

No – While most of the detectors are calibrated close to the achievable performance at the current time, some improvements are recommended (see below).

Comments:

The forward DC has not been calibrated for the most of the ran period. DC calibration was limited to a <10% of runs when accidentally wrong HV settings were used. This

resulted a sizable increase of the widths of residuals for Superlayer-3 and -4 (R2) due to use of constants from calibration of runs with different torus polarity are used.

Recommendation:

Significant shift in the π^0 mass for Sector4. Make sure calibration of ECal sampling fraction sector dependences are in the data base.

Charge #2: (a) *Is data quality as a function of run number or time for the data set that is proposed for pass1 cooking stable and understood?* (b) *Is reconstruction efficiency consistent with expectations and reproducible by appropriate MC simulations?*

- (a) Yes – timelines for most of the parameters have been shown and discussed. Most of the monitored parameters are within expected tolerances. Some outliers will be studied/corrected before pass1.
- (b) Yes – Reconstruction efficiency of the forward detector has been studied using the spring 2019 luminosity scan data. Analysis included the beam background merged low luminosity run. It has been demonstrated that merging the background reproduces the efficiency loss (similar to RG-A).

Comments:

It is expected that the efficiency dependence on the luminosity for fall 2019 data will be similar to that of the spring and RG-A data sets. Nevertheless, we suggest to study it, preferably before the pass1 starts.

Recommendation:

None.

Charge #3: (a) *Are analysis plans for the data set developed at adequate levels?* (b) *Is the list of planned skims defined and tested running analysis trains on preliminary data?* (c) *Are preliminary analysis results for the main reaction channels and observable available and consistent with expectations?* (d) *Is all ancillary information (helicity, Faraday Cup, ...) available and understood?*

- (a) Yes – The analysis plans for the leading candidates for the first publications from RG-B, nDVCS for example, are well developed using the processed data.
- (b) No – The skim list was presented but the output exceeds 20% of the DST data volume.
- (c) Yes – The preliminary analysis results for many physics reactions are encouraging.
- (d) Yes – All ancillary information is available and has been checked,

Comments:

There was a comment that the helicity sign was flipped between the spring and fall runs. This has to be checked. Analysis of the sign of the polarization measure with the Moller polarimeter can show if there was a sign convention change in the injector.

Recommendations:

The skimmed data volume is currently 60% of that DSTs. The large part of the train output (75%) comes from the inclusive skims. The total has to be scaled down to not exceed 20% of the DSTs.

Charge #4: *Are data processing tools that will be used adequate for the proposed processing task? Is the data management plan (staging area, tape destination, directory structure, logs,*

...) defined and appropriate given the available resources? Is the estimate of resources needed to complete the task sound?

Yes – Data processing tools, the data management plan, and the required resources are adequate for processing of this data set.

Comment:

Resources shown are different from what was presented and discussed at the meetings with the software group. To better plan for the data processing, an accurate estimate of data volume, tape, and disk space for DSTs and train (skim) outputs will be needed. (Quoted number of events, 9E9, is 20% lower than what is in RCDB. Will the 4.2 GeV data be included in this pass1 cooking, where the discrepancy comes from?)

Recommendations:

None.

Charge #5: *What are the plans for monitoring the quality of the cooking output and identify/correct failures?*

Yes – Standard monitoring tools are used.

Comment:

The monitoring of normalized yields and beam spin asymmetries have been shown for pass0.

Recommendations:

None

Charge #6: *Is the manpower adequate for the proposed data processing?*

Yes – The available manpower is adequate for completing the calibration and processing of the RG-B fall 2019 data set.

Recommendations:

None.