Nuclear Physics Working Group

Common Tools Committee Report

Raffaella De Vita's Presentation on 11/01/16

https://www.jlab.org/indico/event/180/session/13/contribution/100/material/slides/0.pdf

Charge #2.2

2.2 How these common procedures should be integrated into software tools?

Given the level of development of COATJAVA, Common Tools for the first experiment, providing functionalities needed for calibration, event reconstruction and event selection, should be integrated in this package, possibly exploiting the work that was done for the "data mining" project.

The output of the COATJAVA event selection phase should be made available in evio, hipo and root formats. It should be possible to access, on request, lower level detector banks and/or fully reconstructed and corrected tracks with for example, 4-vectors, vertices, PID info, timing and covariance matrices.

While it may be difficult to converge, in the time frame between now and the first experiment, on particular scheme to implement tools for signal selection and physics analysis, strict guidelines and checks to ensure validity and encourage the use of common approaches should be enforced. As such we suggest any algorithm or technique should be pre-reviewed by an Analysis Review Group prior to any final Analysis Note to create a speedier final review process. Any individual analysis could then just be required to check the technique for their reaction through a simulated validation. Anyone implementing a new technique should be encouraged to make common software available to the rest of the collaboration, thereby building up our stock of innovative and reliable Common Tools.

Actions

1. Complete the COATJAVA reconstruction and calibration tools. This must be done keeping future code developments backward compatible with the present version 3.0.

2. Extend COATJAVA to incorporate Event Selection, as per our definition.

3. Create a new group of "wise experts" (Analysis Group) who will guide the development of algorithms for momentum corrections, PID, background subtraction, fiducial cuts and other corrections, exploiting the expertise accumulated with analysis of CLAS data. Algorithms developed by this group should be reviewed by an analysis review committee (see 4). Upon approval they should be considered "standard", requiring no further review when applied to specific analysis and only a short reference in future analysis notes.

4. Create a "First experiment analysis review committee" drawn from the relevant PWGs before the experiment even begins, and have that committee review each individual tool/algorithm/method used to arrive at Physics results, as they are being developed (by the RG A collaborators or the "experts" in 3). If this approach will prove to be effective for the First Experiment, it should be extended to any future CLAS12 experiment.

Data Analysis Scheme