Software Session

November 7, 2023

Agenda

Tuesday, November 7

14:00 → 15:35   **Software and Computing**

Convener: Raffaella De Vita (INFN - Genova)

14:00   **Introduction**

Speaker: Raffaella De Vita (INFN - Genova)

14:15   **SciComp perspective for the 12 GeV program**

Speaker: Brad Sawatzky (Jefferson Lab)

14:45   **HYDRA for CLAS12**

Speaker: Torri Jeske (JLAB)

15:10   **Level3 trigger: status and plans**

Speaker: Richard Tyson (University of Glasgow)

15:30 → 16:00   **Coffee break**

16:00 → 18:30   **Software and CalCom**

Convener: Raffaella De Vita (INFN - Genova)

16:00   **Recent improvements to forward tracking**

Speaker: Tongtong Cao (Jefferson Lab)

16:30   **Kinematic fitting tool for CLAS12**

Speaker: Trevor Reed (FIU)

16:50   **RICH particle Identification using Machine Learning**

Speaker: Armen Gyurjinyan

17:10   **Discussion**

Thursday, November 9

09:00 → 11:00   **Plenary 3**

Convener: Raffaella De Vita (INFN - Genova)

09:00   **Software Tutorial**

Speakers: Maurizio Ungaro (Jefferson Lab) , Nathan Baltzell (Jefferson Lab) , Raffaella De Vita (INFN - Genova)

Bases in Unix/Linux/shell/environment

Speaker: Nathan Baltzell (Jefferson Lab)

Walkthrough of software documentation

Speaker: Nathan Baltzell (Jefferson Lab)

CLAS12 simulations on OSG

Speaker: Maurizio Ungaro (Jefferson Lab)

How to run the full simulation chain

Speaker: Raffaella De Vita (INFN - Genova)

10:30 → 11:00   **Coffee break**

11:00 → 12:30   **Plenary 4**

Convener: Raffaella De Vita (INFN - Genova)

11:00   **Analysis Software and Survey Results**

Speaker: Christopher Dilks (Jefferson Lab)

11:45   **Discussion**

Pass2 status

- Reprocessing of RG-A, B, and K data with improved reconstruction software, aka "Pass2", in advanced stage:
  - Software release in April-May
  - Data processing started in May
  - Currently RG-A Fall 2018 close to completion
  - Next is RG-B Fall 2019 and Spring 2020 data:
    - Readiness review last week
    - Few comments to be addressed before cooking but should be ready shortly
  - Last will be RG-A Spring 2018, which is being prepared to check/redo calibration

Elastic protons detected in CVT
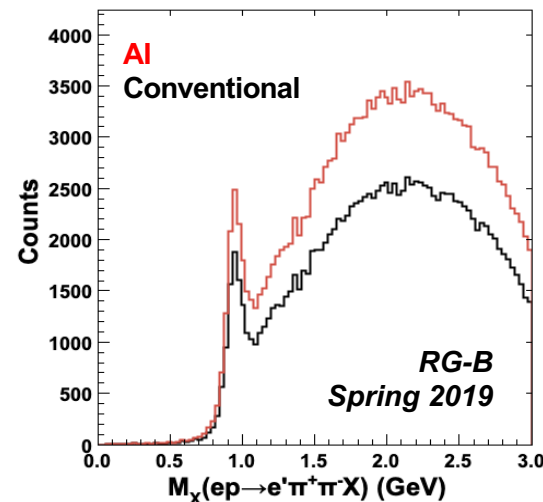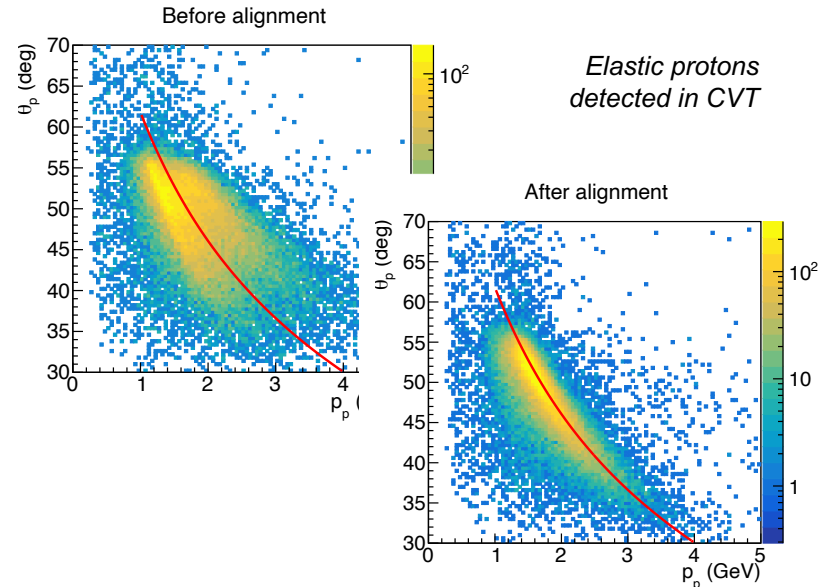
Comparison of the two-pions missing mass from conventional and AI-assisted tracking

CLAS12 simulations on OSG

- **New OSG portal** online since mid-September:
  - Support for multiple software versions:
    - Pass1 and Pass2
    - Different run groups
  - Vertex manipulation options
    - x,y beam size
    - Target position and length
    - Raster
  - Uses gcards and yamls from **new clas12-config github repository**
    - support for different run groups configurations and software versions

- Upcoming:
  - Reorganization of simulation output:
    - One folder per batch with all jobs output instead of one folder per job

More in Thursday's software tutorial

https://gemc.jlab.org/web_interface/index.php

Home   **About**   **Disk Usage**   **OSG Stats**

| Configuration	[⬍]
Versions (see **README**)	gemc/5.4 coatjava/10.0.2 [⬍]
MC Gen Versions (see **README**) Consider **testing the generators**	2.33 [⬍]
Magnetic Fields	[⬍]
Vertex	☑ z: adjust for target position and semi-length n/a ☑ x/y: smear beamspot n/a ☑ x/y: raster n/a ⦿ Ignore Generator Vertex ○ Relative to Generator Vertex
Generator	[⬍]
Generator Options	[ ]
Once you've chosen the generator, review the linked documentation and insert the desired options above. Do not utilize the following options, as they are automatically included: *--docker, output file name, --trig .*	
Number of Events per Job	[ ]
Number of Jobs	[ ]
Total Number of Events	M
Background Merging	Not Available [⬍]
	Submit

Run-dependent simulations

- Current simulations use a fixed run number and get run-group dependent conditions (e.g. list of malfunctioning elements) reading CCDB tables from different variations
  - Sufficient to account for main or average conditions in a data set
  - High maintenance because of multiplication of CCDB tables, gcards, and yamls
  - Impractical for implementing run-by-run changes such as temporarily dead elements

- Efforts started toward running simulations with "real run numbers":
  - The user will provide a list of run numbers and the total number of events
  - The number of jobs per run will be automatically determined based on accumulated charge information
  - The resulting batch will reproduce the features of the data set

- To do:
  - Implement a mechanism to generate the correct GEMC configuration for a specific run number
  - Ensure GEMC digitization is consistent with reconstruction algorithms for real run numbers
  - Copy all relevant info from currently used variations to relevant run ranges
  - Implement on the OSG portal the mechanism to transform a run list into a job list

- Plan to have this ready in early 2024

User support

- "Traditional" tools:
  - Software center wiki
  - Mailing list:
    clas12_software@jlab.org
  - Software forum

- New initiatives:
  - Software tutorial on Thursday morning
  - Office hours every week on Tuesday at 9:30 am

Centralized software wiki:
https://clasweb.jlab.org/wiki/index.php/CLAS12_Software_Center
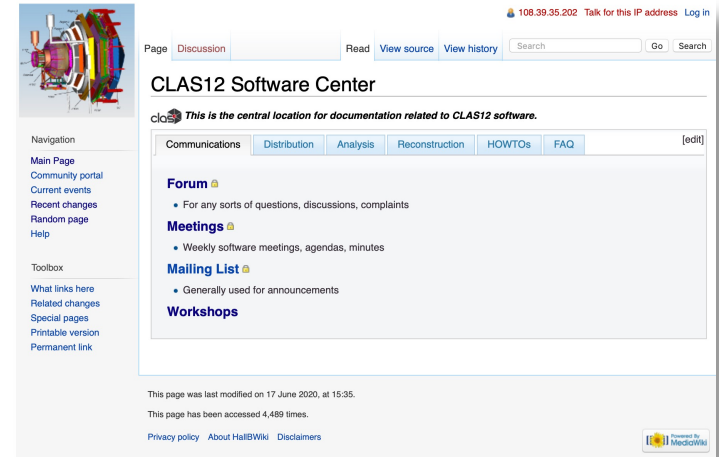
Discourse forum for software related questions and communications