

# GlueX Software Stack on ALMA9

# Why

- ALMA9 is the new platform supported by JLAB
- Older platforms will disappear
- JLAB is installing new batch farms with ALMA9
- ALMA9 has more modern gcc:
  - gcc (GCC) 11.4.1 20230605 (Red Hat 11.4.1-2)
  - Ubuntu 22.04 has gcc 11.4.0
- IFARM9 provides interactive farm with ALMA9
  - ifarm1901, ifarm1801 and ifarm1802 will be phased out

Prerequisite: python3 and as consequence cddb v2

# Step 1: compile/link CCDB V2

A new version of CCDB is available on github v2-main:

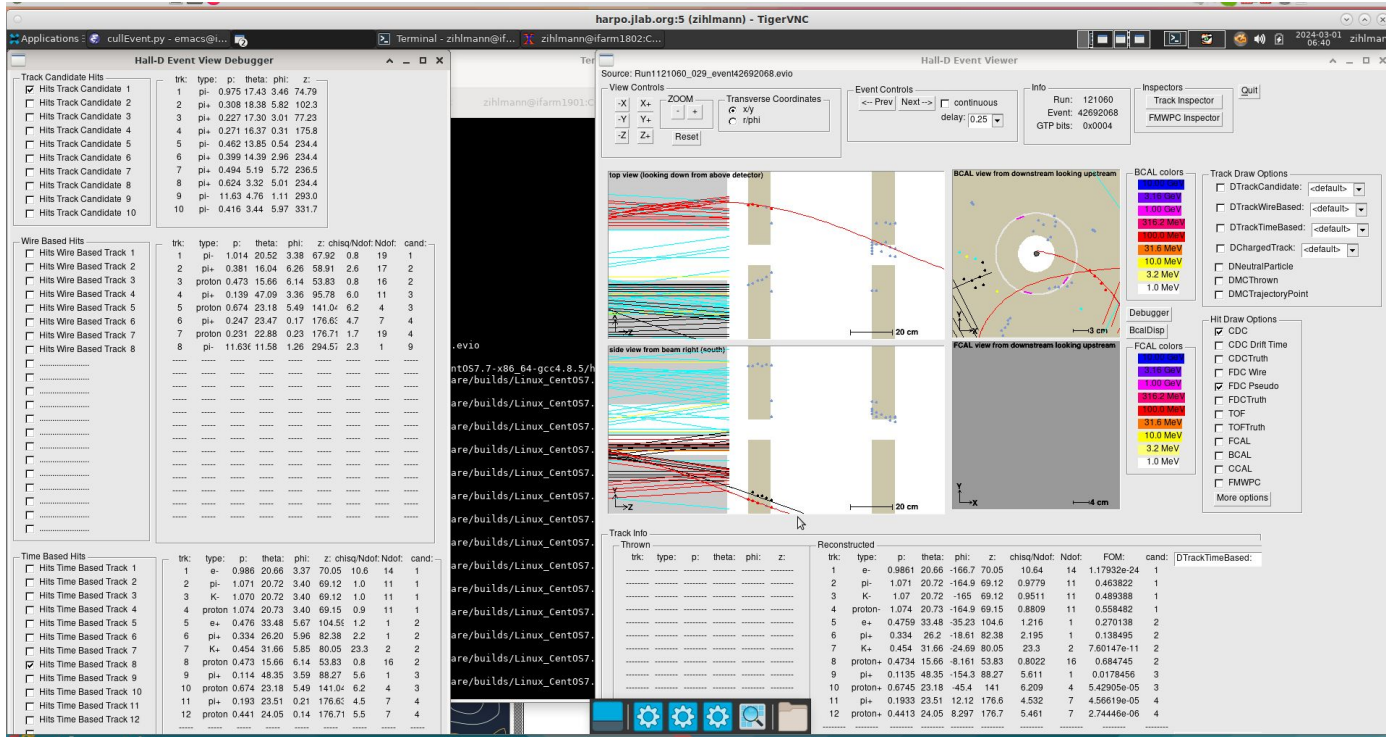
<https://github.com/JeffersonLab/ccdb>

- Compiled and linked ccdb v2 successfully on ALMA9 (with python3)
- Installed new ccdb database server on local machine
- Populate new ccdb database server with data from halddb.jlab.org
- ccdb **read** is working
- ccdb **writing** is NOT working (yet)

## Step 2: compile/link JANA, halld\_recon with ccdb v2

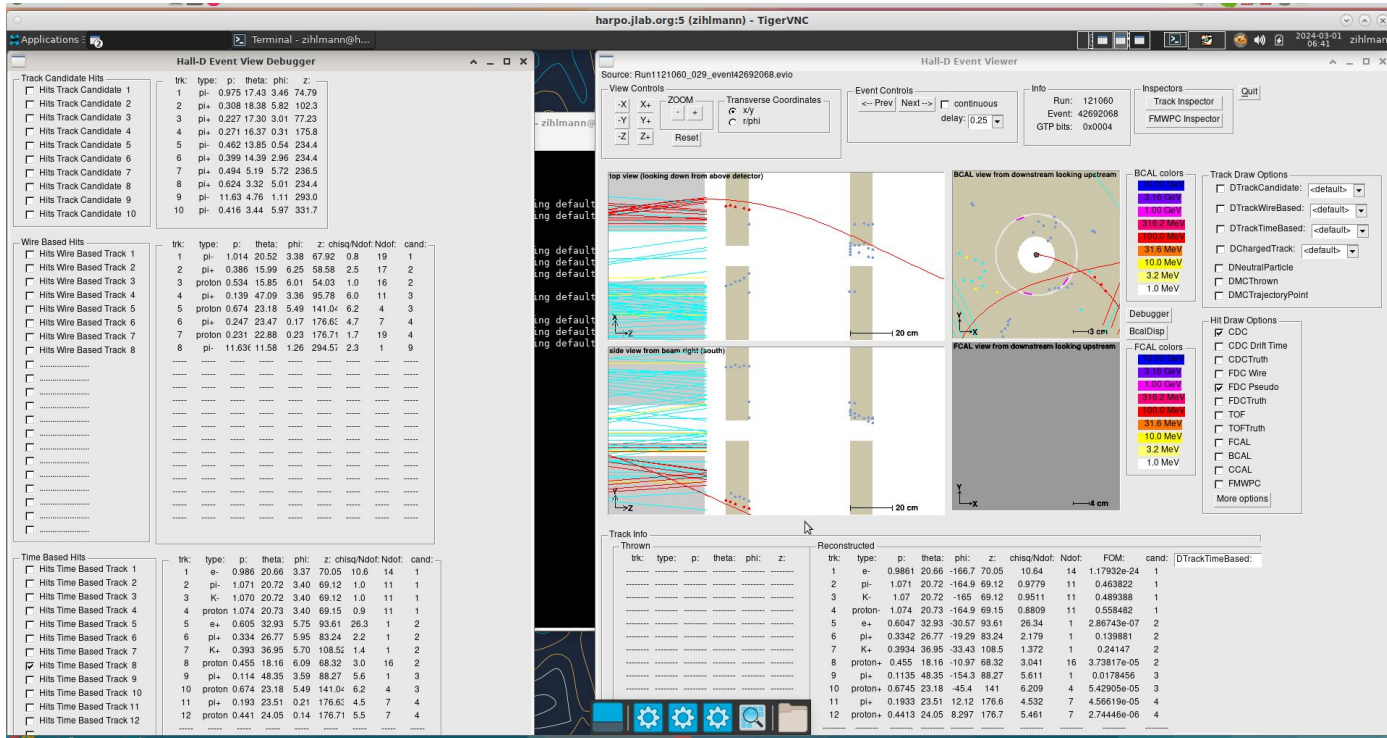
- Successfully compiled JANA and halld\_recon on ALMA9 with ccdb v2
- Successfully run hd\_root, hd\_dump and hdview2
- However, ALMA9 does not provide same result as CentOS7
  - Showed that ALMA9 local, ALMA9 on IFARM9 and ubuntu 22.04 all give same result
  - All basic DANA objects are identical to CentOS7 like ifarm1901, like: DTOFHit, DSCHit, DBCALShower, DFCALShower, ....
  - However, they differ some times at the level of DWireBased objects
  - The difference is most likely in tracking
  - All DTrackCandidate objects are identical, differences start to appear at the DWireBased tracking stage.

# Example file hd\_rawdata\_run121060\_029.evio: Event 42692068 CentOS2 hdview2



CentOS7  
Track Candidate 2  
WireBasedTrack:  
 $p=0.381$   
 $p=0.473$

# Example file hd\_rawdata\_run121060\_029.evio: Event 42692068 ALMA9 hdview2



ALMA9  
Track Candidate 2  
WireBasedTrack:  
 $p=0.386$   
 $p=0.534$

Note not same red curve and not same points either.

# Verifications

Verified with different ALMA9 system using ccdb v1 and ccdb v2

Verified with UBUNTU 22.04 system using ccdb v2

All implementations using gcc 11.4.0 (1) give identical results

They all differ from “old” CentOS7 ifarm1802 results (gcc 4.8.5)

Differences vary in “size” from minor ( $e-6$ ) to significant

Major difference show up in WireBased tracking (Track candidates identical)

# Path forward

Fix ccdb v2 writing

Find cause of difference between CenOS7 and ALMA9 (gcc 4.8.5 vs gcc 11.4.0/1)

Geant4 with c++14 standard

Latest version of root 6.30.04 requires c++14 standard

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Eventually JANA V2