Hall C

Mark Jones , Hall C Staff

Overview

- Most experiments will use the existing High Momentum Spectrometer (HMS) and the new Super High Momentum Spectrometer (SHMS).
- HMS and SHMS have similar detector packages: Drift Chambers, Scintillator hodoscopes, gas Cerenkov, Aerogel, Lead-glass calorimeter.
- Several experiments use new apparatus: neutron polarimeter, neutral meson spectrometer, Backward angle hodoscope third arm.

Status and Timeline

- SHMS carriage is on the pivot and detector hut is being built.
- Magnets being built. Installed in late 2014 thru 2015
- Beam commissioning in Feb 2016

Goals and Management Structure

Goals of Hall C Software

- Develop a C++/ROOT based analysis code based on the existing Hall A code.
- Test new HMS code against original Fortran code (ENGINE) using 6 GeV HMS data
- Test new SHMS code against original Fortran code (ENGINE) using 6 GeV SOS data

Management Structure

Activity	Person	Institute
Software Manager	Mark Jones	Jefferson Lab
C++/ROOT Analyzer	Gabriel Niculescu	James Madison University
Calibrations	John Arrington	Argonne National Lab
Online histogramming	Pete Markowitz	Florida International Univ.
Simulation (SIMC)	David Gaskell	Jefferson Lab

Present Status

- HMS Drift Chamber tracking code is working and comparisons to Fortran analyzer have been done. Need to add best track selection and tracking efficiency code.
- Now with tracking done, HMS hodoscope and calorimeter coding and comparisons can be finished.
- HMS gas cerenkov and aerogel comparisons in progress.
- Using git for version control and Github as repository server. Github is easier for offsite users and has tools for communication and tracking issues and milestones.
- Added the ability to use SCONS for building code to eventually replace Make. Makes it easier to build on different platforms.
- Documentation on Hall C wiki to allow users to get involved.
- Integrating Hall C scalars into PODD.
- Adding of Hall C report templates.

Progress on Milestones

2012

July : Define reference HMS data for testing code

- Using data from “Jan05” experiment

Sep : Documented non-tracking HMS detectors code in Fortran Analyzer

- Calorimeter done
- Hodoscope partly done
- Aerogel, Gas Cerenkov not done

Oct : Make DAQ decoding in C++ Analyzer object-oriented

- Joint with Hall A and has started

Oct : Ability to analyzed Hall C data at the raw data level in C++ Analyzer

- Done

Dec : Documented the drift chambers and tracking code in Fortran Analyzer

- Not done

Dec : Verify HMS hodoscope analysis in C++ Analyzer

- Done (as far as could be without tracking)

Progress on Milestones (part 2)

2013

Jun : SHMS code added to Fortran Analyzer.

- Not done
- Decide not to do since expecting beam to Hall C in 2016

July : Full analysis of HMS data with C++ Analyzer ready

- Not done
- Drift Chamber tracking code ready.

Sep : C++ Analyzer ready for SHMS calorimeter tests.

- Not needed

Dec : Full analysis of HMS data with C++ Analyzer verified by comparison to Fortran analyzer.

- Will postpone

Updated Milestones

2014

Jan: Hall C specific BPM/Raster code. Hall C report templates

Mar: Update PODD scalar code for Hall C scalar data.

June: Complete documentation of Fortran code.

Dec : Full analysis of HMS data with C++ Analyzer verified by comparison to Fortran analyzer.

Dec: Nightly builds

2015

Feb : Calibration codes ready.

Dec : Analyze cosmic ray data in SHMS

Summary

Response to recommendations

- Not developing SHMS Fortran code.
- Plan on nightly builds when code is more developed.
- Investigating use of code evaluation codes such as cpp_check and valgrind

Afternoon talks:

- “Comparisons between HCANA and ENGINE”,
  Gabriel Niculescu, JMU
- "Hall C General Updates and additions to PODD“,
  Ed Brash, CNU