ePIC Electronics and DAQ WG Meeting

1. Introduction
2. Discussion FEB / RDO counts for

Wiki Updates

- I cleaned up the wiki a bit (https://wiki.bnl.gov/EPIC/index.php/DAQ)
  - It has two useful features
    1. The index of all of our meetings, you can search up the historical presentations easily
    2. Links to DAQ presentations, common slides, and tables
       - These had been on my own dropbox
       - They are now moved to the public sharepoint site. Please check if you can access it…
  - There are links to the old Athena / ECCE information, but the ECCE info links are broken. If anyone knows the correct links let me know and I can update them. Otherwise, I'll delete them.

Schedule / Meetings

- Last week: EIC Detector Comprehensive Design Review, DAC Review of detector R&D
- Sept 20-22 – In person software and computing (UIC)
  - https://indico.bnl.gov/event/20159
- October 10-12 – EIC CD-3A Director's Review (BNL)
- October 19-20 – ePIC Software and Computing Model Review
- November (???) – EIC CD-3A Independent Cost Review
- November 14-16 – EIC CD-3A OPA Independent Project Review (BNL)
- November 26-December 1 – SRO XI (Hawaii)
  - https://indico.bnl.gov/event/20010/
  - Jo Schambach, overview of ePIC DAQ
- December (week of 4th)– Computing Model presentation to EIC Resource and Review Board
- January – Collaboration Meeting
  - Parallel Sessions "Workfests"
    - SRO joing ½ day with E&DAQ + Software Computing
    - Dedicated session for DAQ / Detector interfaces as well?

Results of CDR

For detector as a whole: “Amazing progress in the last two years, congratulations to all working on the EIC for this enormous achievement”

Other cherry picked recommendations/comments from the reviewers (picked because they are relevant to Electronics and DAQ)

- ASIC development should be closely monitored as it has often taken significantly more time and effort than originally planned.
- There remains concern that radiation hardness and background rate issues may still affect detector performance (and design), with time-dependent rate and noise dependences. We urge the incorporation of the machine background expectations into the detector simulations as well as attempting to provide conservatively large safety margins.
- Component failure rate requirements incorporated in evaluation of performance would be useful for evaluating detector technology
- A comprehensive description of the survey/alignment/monitoring and calibration strategy for the hardware components of all detector systems is needed.
- The cooling infrastructure for the SiPM needs some further study, as unforeseen issues could impact the interface to nearby detector systems; likewise, high background currents could require significant cooling.
- A summary of the different types of SiPM being planned for long procurement would be useful for evaluating whether they are optimal in pixel size and environmental sensitivity.

Aimed particularly at Electronics & DAQ:

- Recommend continued study of the detector readout and DAQ strategy. In particular, the resource necessary to support all aspects of the R&D, production and commissioning, throughout the period between CD2/3 and CD4.
  - → I didn’t give very concrete answers with respect to resources planed, and in particular, for the firmware development
  - → They really encouraged development of Electronics/DAQ components to be available at a very early stages of detector development
  - → There was some skepticism/confusion regarding the fact that the computing facility resources are not part of the project

FEB / RDO Counts

1. We now need firm FEB / RDO counts for the central detector
   - We need to have space -> engineering drawings and integration of the physical boards
   - Need to make progress on cooling needs
   - Need to make progress on evaluating radiation effects
2. Need to have specific sizes for RDOs for each detector
3. I think we've reached the end of the usefulness of the informal counts I've been trying to do.

→https://brookhavenlab.sharepoint.com/:x:/r/sites/EICPublicSharingDocs/_layouts/15/Doc.aspx?sourcedoc=%7BEF07971D-CB26-42C3-B692-E4497FCEA654%7D&file=ePIC%20Detector%20Scale%20and%20Technology%20Summary.xlsx&action=default&mobileredirect=true