

# Software Update

HPS Collaboration Meeting, May 4, 2017



## It basically works...

- The software "basically works". We are getting results.
- We cannot be complacent, many parts are not as good as we like:
  - Vertexing Bug
  - Tracking improvements.
  - MC details closer to Data.
  - Speed improvements.
  - Update DQM

University of

- "Framework" improvements.
- Task lists seem to never get any shorter

## People Power Needed

- Biggest issue ahead: Continuity
- Our current group of graduate student experts has graduated, is about to graduate, or is working to graduate soon. (Sho, Omar, Holly, Sebouh, Ani, Kyle, Bradley).
- Postdocs are in similar situations, moving on or looking to move on.
- The "2018 run" will be more demanding!
- New students, postdocs, staff, are needed to take over critical tasks and maintenance of software components...

## Feedback Loop

- The feedback loop: Analysis 
   → Software 
   → Analysis
   can be tightened.
  - Analysis generates tasks for which people doing the analysis are too busy. Software group picks up task.
  - Only works if there are capable people in the software group to pick up the task.
  - Only works if there is sufficient turn-around.
  - Examples:
    - Track states at every SVT layer.

## New "Tzars"

- The EC decided (Nov. 2016) to create two new leadership positions, one for Tracking and one for Monte Carlo.
  - Both areas have come to the forefront in analysis
  - Both area could use additional manpower and oversight.
- The MC "tzar" Takashi
  - Oversee the production runs
  - Organize and check production runs & analysis
  - Direct improvements to the MC code base, the physics event generators, and the detector geometry.
- Tracking "tzar" Omar
  - Organize results of the tracking tests and analyses
  - Direct the improvements to the code base and the detector alignment
  - Ensure we have high quality results from our tracker.

All aspects of our code can use improvements...

• Yet Another Task List:

https://confluence.slac.stanford.edu/display/hpsg/Software+Task+List

- Needs continuous updating/ task ranking.
- Needs people assigned.

### **Specific High Priority Tasks:**

#### I. Tracking + Vertexing presented earlier: Omar & Norman

- "Vertexing Bug" See Holly's talk yesterday.
- Best track selection See Holly & Norman's talks.
- Seed Tracker speed up. Try different algorithms. See Norman's talk
- GBL/Alignment Improve functioning/make easier? See Allesandra + Norman's talks.

### 2. Monte Carlo Improvements presented earlier: Takashi & Bradley

- Use data for beam background  $\Rightarrow$  Tools to mix data (pulser, mixed events, etc) in with MC.
- Improve job scripts to simplify MC production.

### 3. DQM

- Framework was implemented, but never received quite the attention that is needed. This task is not "trivial", and should not be put off until the last minute before the next run.
- Cleanup histograms
- Clearer diagnostics, automatic histogram comparison, ...

### **Specific High Priority Tasks:**

### 4. Readout:

- Needs a thorough review. Code speedup.
- Check/improve resolutions vs data.

### 5. Integrating Upgrade components:

- L0 integrate in tracking.
- Positron Trigger Integrate in MC, readout, recon, trigger simulation.

#### Other Tasks:

### I. Reconcile Tuple-maker and DST-maker.

• Not ideal to have 2 systems.

### 2. Event Display updates.

- Before next run: new info for L0 and e+ trigger.
- Revisit/cleanup histograms.

#### 3. Improvements to Data Catalog/Run Database/Conditions system.

- Make this more useful for the analysis.
- Get data into these systems more automatically.

#### 4. HPS-Java framework improvements.

• Continuous effort to maintain and improve.

## Move to GitHub

- Code base was moved from SVN to GitHub
  - JIRA tasks are now GitHub issues (but they weren't all ported)
  - Some documentation updated.
  - Release framework updated.
- GitHub Locations:
  - <u>https://github.com/JeffersonLab/hps-java</u>
    - All the main Java code.
  - <u>https://github.com/JeffersonLab/hps-dst</u>
    - DST code was always on GitHub.
  - <u>https://github.com/JeffersonLab/hps-mc</u>
    - Generators Scripts
  - <u>https://github.com/JeffersonLab/HPS-CODE</u>
    - Analysis Calibration Online Production
  - <u>https://github.com/slaclab/slic</u> + <u>https://github.com/slaclab/lcdd</u> + <u>https://github.com/slaclab/gdml</u>
    - SLIC, LCDD and GDML codes

# Finally

- We will again reschedule weekly meeting times.
  - Please participate in rescheduling, so you can/will participate in the meeting.
- Documentation...
  - Found at: <u>https://confluence.slac.stanford.edu/display/</u> <u>hpsg/Computing+and+Software</u>
  - Continuous effort needed by everyone to keep documentation up to date.