TrigSim Status

- What is TrigSim?
- How do I run it?
- How does it compare to actual hardware?
- Where can I get more info?
- What version do I use?
- Features of p15.06.00?
- Drawbacks of p15.06.00?
- What are future plans?

What is TrigSim?

- It's a trigger simulator/wrapper that runs offline
- It takes as input an event file with a Raw Data Chunk (RDC)
- It simulates L1 (except cal on data)
- It simulates and/or runs L2
- It runs L3
- It makes output files (DST and TMB)
- coordinators are Angela Bellavance and Dugan O'Neil

Basic running

- the d0tools command is: `runD0TrigSim`
- required inputs are:
  - `-format=`
    - `-format=data`
    - `-format=mc`
  - `-filelist=<filename>`
    - use full path names in text file `<filename>`
    - one file per line

Basic running with data

runD0TrigSim -format=data -filelist=<input>

- **Input files:**
  - **RawDataChunk (RDC)**
  - **online L3Chunk**
- **TrigSim:**
  - **Copies RDC and online L3Chunk**
  - **Processes RDC to make L1L2Chunk and offline L3Chunk**
  - **Calls thumbnail to run on all chunks**
  - **Creates output files**
- **Output files:**
  - **DSTs with RDC, L1L2Chunk, online L3Chunk, offline L3Chunk**
  - **TMBs**

Basic running with MC

runD0TrigSim -format=mc -filelist=<input> -l3reprocess

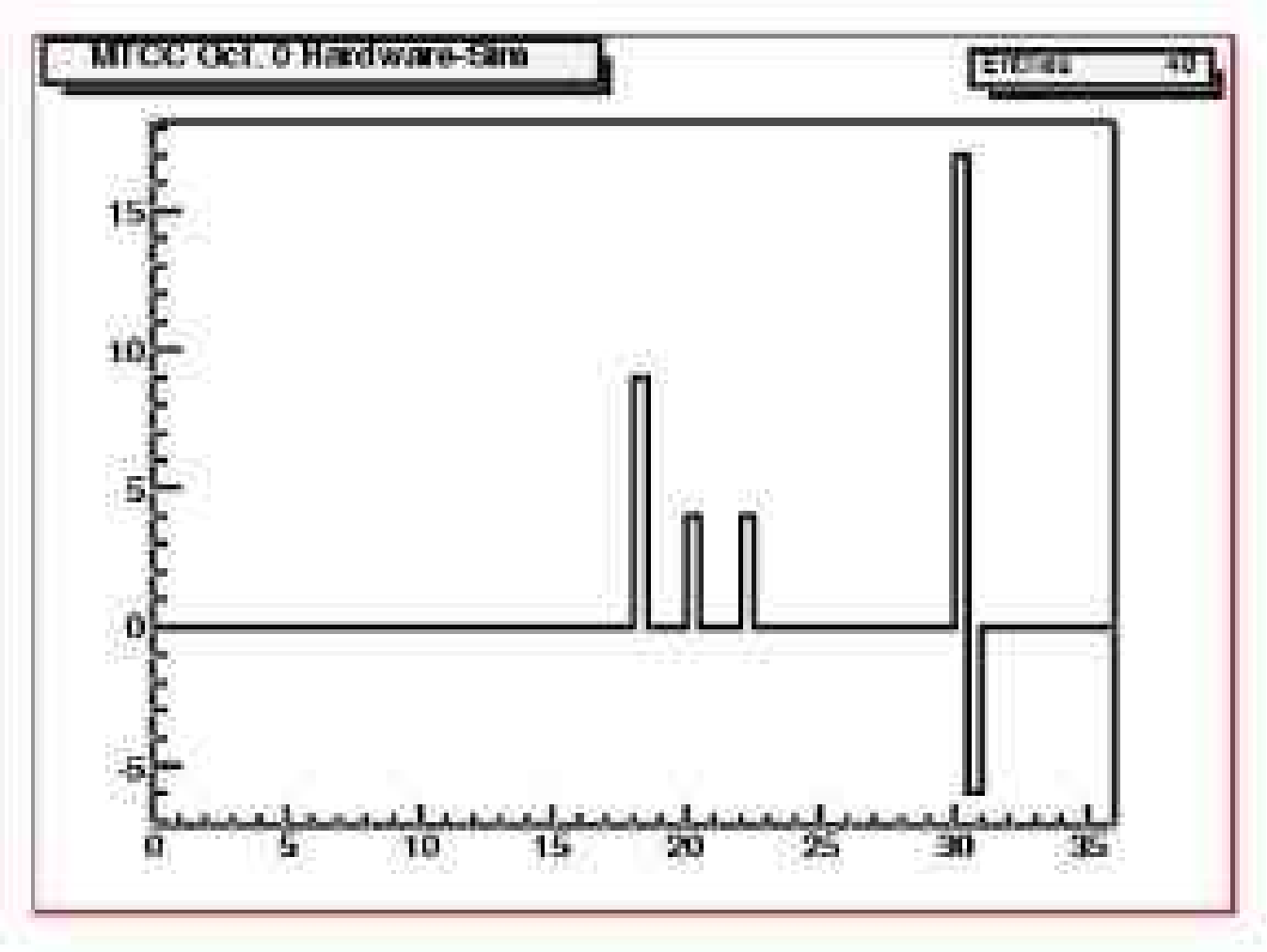
- **Input files:**
  - **RawDataChunk (RDC)**
  - **L1L2Chunk**
  - **offline L3Chunk**
- **TrigSim:**
  - **Copies RDC**
  - **Reprocesses L1L2Chunk**
  - **Processes RDC to make offline L3Chunk**
  - **Calls thumbnail to run on all chunks**
  - **Creates output files**
- **Output files:**
  - **DSTs with RDC, L1L2Chunk, offline L3Chunk**
  - **TMBs**

Hardware vs. TrigSim

- L1 muon
  - plots made online and stored for 24 hours
  - http://www-d0online.fnal.gov/www/groups/l1muo/
  - contact: Stefan Anderson
- L1 calorimeter
  - online trigger versus TrigSim comparisons are not currently possible because the online inputs to the trigger are not stored for cal
  - contact: Josh Kalk, Joe Kozminski
- L1 fiber tracker
  - contact: Vivek Jain, Brigitte Vachon

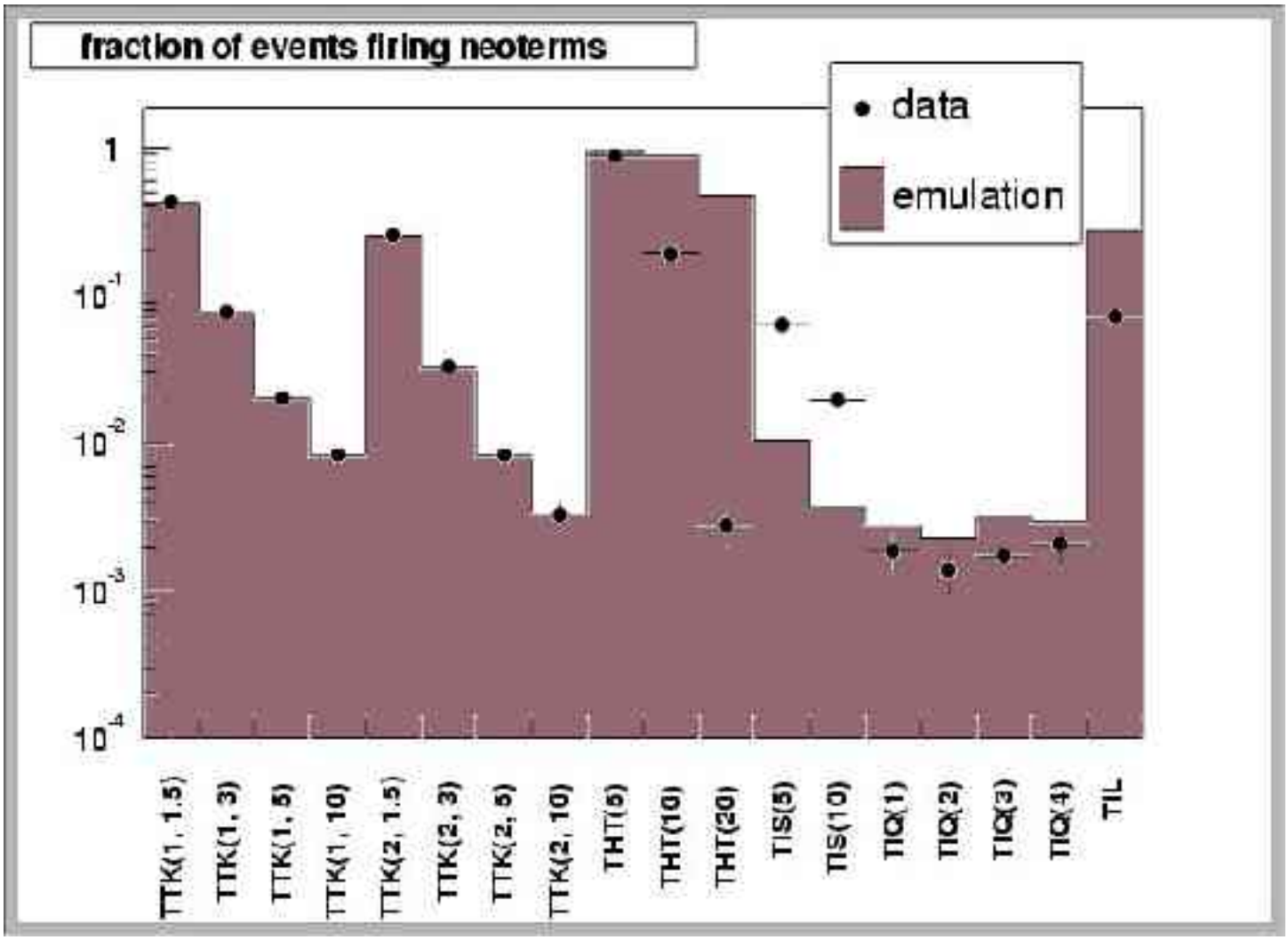
Hardware vs. TrigSim – L1 Muon

example of comparison plot



Hardware vs. TrigSim – L1 CTT

CTT neoterms
~5700 minbias events from run 180080



Hardware vs. TrigSim

- Gordon Watts has done some studies
  - re-run data through TrigSim using same trigger list as was online
  - show <15% disagreement between online triggers and TrigSim
  - largest difference in tracking; cause has been determined
  - next largest difference is in muon triggers
  - a note is being prepared

What version do I use?

- recommended version is
  p15.06.00

- online L3 : p15.02.03
- online L2 : p15.04.00
- MC farms : p15.05.00?

Info on Web

- **TrigSim web site can be reached from the 'D0 At Work' page, or directly at:**

  `http://www-d0.fnal.gov/computing/trigsim/trigsim.html`

- **Most important links:**
  - **Documentation under `Trigsim Docs`**
  - **Release notes under `p15` and `test release`**
  - **Contacts under `Contacts`**

Web site cont.

- recent additions
  - 'Examples' section of the manual - thanks Arnaud!
  - link to the FAQ page added to home page
  - pre-fixed .sim files for trigger lists v12.20 and v12.30 (hope this will not become habit)
- planned additions
  - links to comparisons between online triggers and TrigSim
  - link to d0trigsim-users mailing list archive

Features of p15.06.00 - ☺

- produces TMBs
- L3Chunk now cleans up after its child processes (allows SAM files to close properly)
- recovered from muon calibration interface change
- tool destruction handling improved (fewer end-of-job crashes)
- HT objects added to output
- L2CTT info is available
- improved L2 EM algorithm
  - position of seed tower nearest neighbor described differently
  - added ability to split L2 objects into constituant towers
  - definition of EM fraction modified

Drawbacks of p15.06.00 - ☹

- produces TMBs
  - l1cal_reco is wrong
  - lots of packing and overflow errors from Objs
  - will sometimes crash TrigSim
- still get some end-of-job crashes, but output file ok
- TrigSimAnalyze will crash if run with MUO_CENTRAL_MATCH
  - fix available in l3fanalyze p15-br-10
- simulated L1 cal still does smearing like it did back in December, while reality has improved; only matters for really tight requirements
- memory leak?

Future Plans - version numbers

- L2 will continue development of online code in p15.07.00. Goal is to combine STT and CTT into one crate/worker by end of shutdown.
- expect there to be a p15.06.01 to fix the problems in p15.06.00
- scheduled to cut p16 from the test branch at the beginning of December
  - mostly for L3, hope to merge in L2 from p15.07 quickly
  - p16 will be for the v13 trigger list
  - deadline for adding new code to test branch is November 14

Future Plans cont.

- L1 fiber tracker - Jain
  - change tsim_l1ft to read equation files for calibrated pT and charge info. Previously info was recalculated by tsim_l1ft from raw pT ranges.
  - add new trigger terms: four TEL (2,pT) and two TIS
  - need to completely re-write CPS stereo simulation because of hardware change - need help with this!!

Future Plans cont.

- L1 framework - Kalk
  - does not handle L1 bits well; Gordon Watts is repairing
  - hope to have pseudo terms (PTerms) working online “soon”
  - TrigSim can already handle them, can be added to the input now if desired
- L2 tracking - Kopal, Wittlin
  - combine CTT+STT
  - combine STT with IP

Future Plans cont.

- stop using TrigSimAnalyze - newer, better-supported code is available
  - TMBAnalyze
    - contacts: Gordon Watts, Serban Protopopescu
  - top_analyze
    - contacts: Freya Blekman, Brigitte Vachon
  - trigsimcert
    - contact: Josh Dyer
    - not linked with release numbers
    - runs on TrigSim TMB output
    - L1 and L2 good; L3 improving

Parting shot -
think of me as a Black Widow spider...

- need 8 legs to cover my responsibilities
- Trigger bugs get caught in my web
- initial response to bugs is quick
- many bugs need time to be digested
- every bug means a repair job to web

Questions?