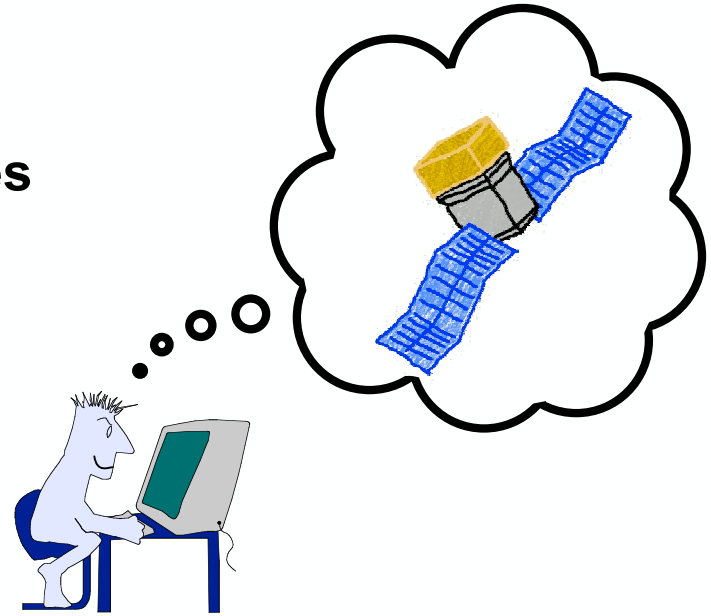
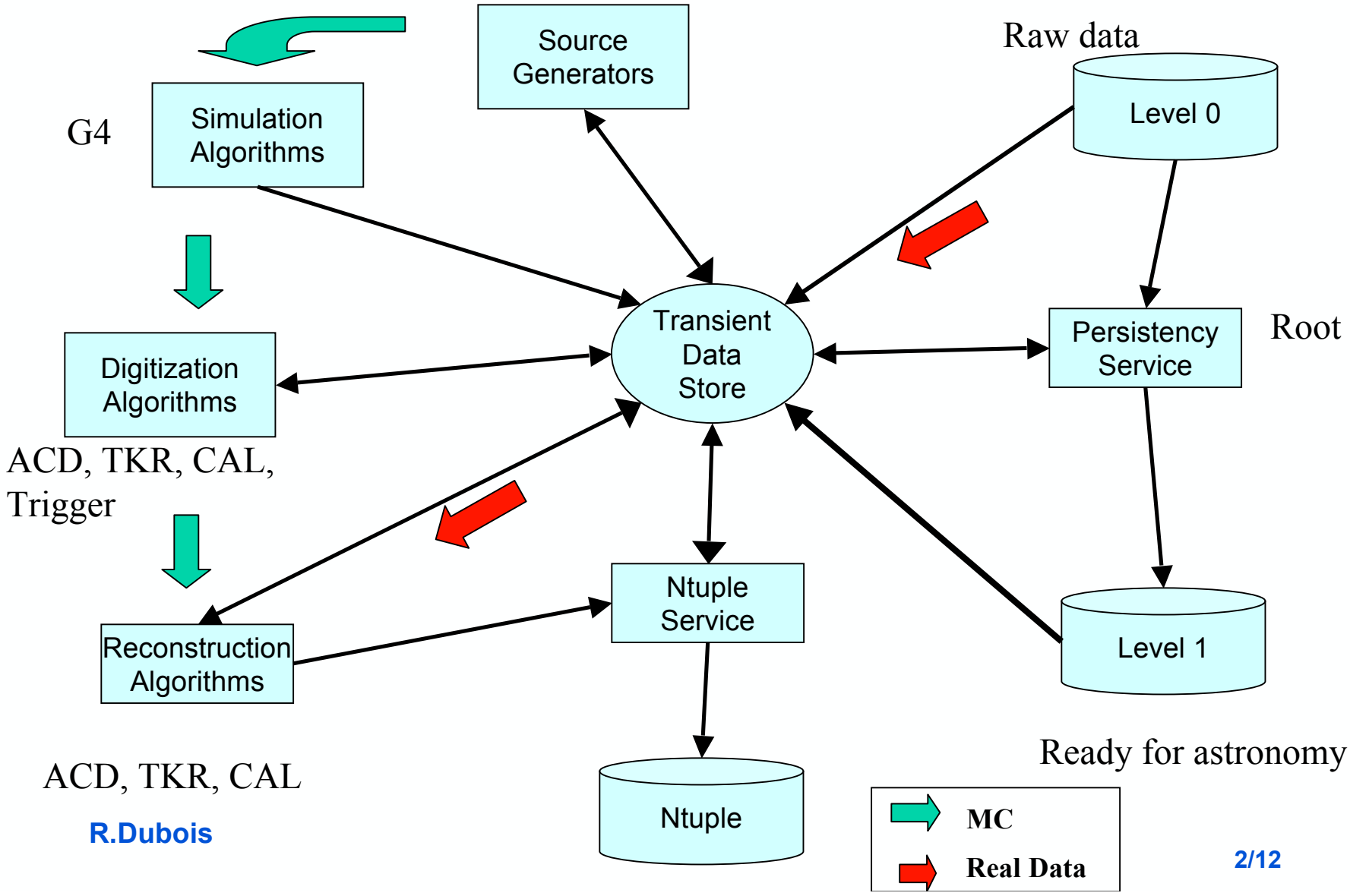
# Introduction to Gleam

- Major release is imminent - end October
  - When
  - What to expect
- Quality Control
- Short & Longer term schedules



# Data flow in Gleam



# Gleam Features

- G4 simulation
- Flexible geometry via xml
  - To handle flight, EM & CU
- Flexible job configuration via Gaudi jobOptions file
- New TKR recon/patrec
  - 3D combinatoric
  - New VTX finding
- Full Root I/O from MC, Digi and Recon
- Analysis possible from compiled code ("userAlg") and Root output files/macros
- ACD digi updated; Recon has "active distance" to tracks
  - Distance to tile edges
- CAL digi updated
  - Option for non-linear light attenuation
- TKR digi has options for
  - Simple digi
  - "Bari" digi with TOT and charge sharing
    - Under test
- CAL recon leakage corrections being examined.

# Gleam Checklist for Oct Release

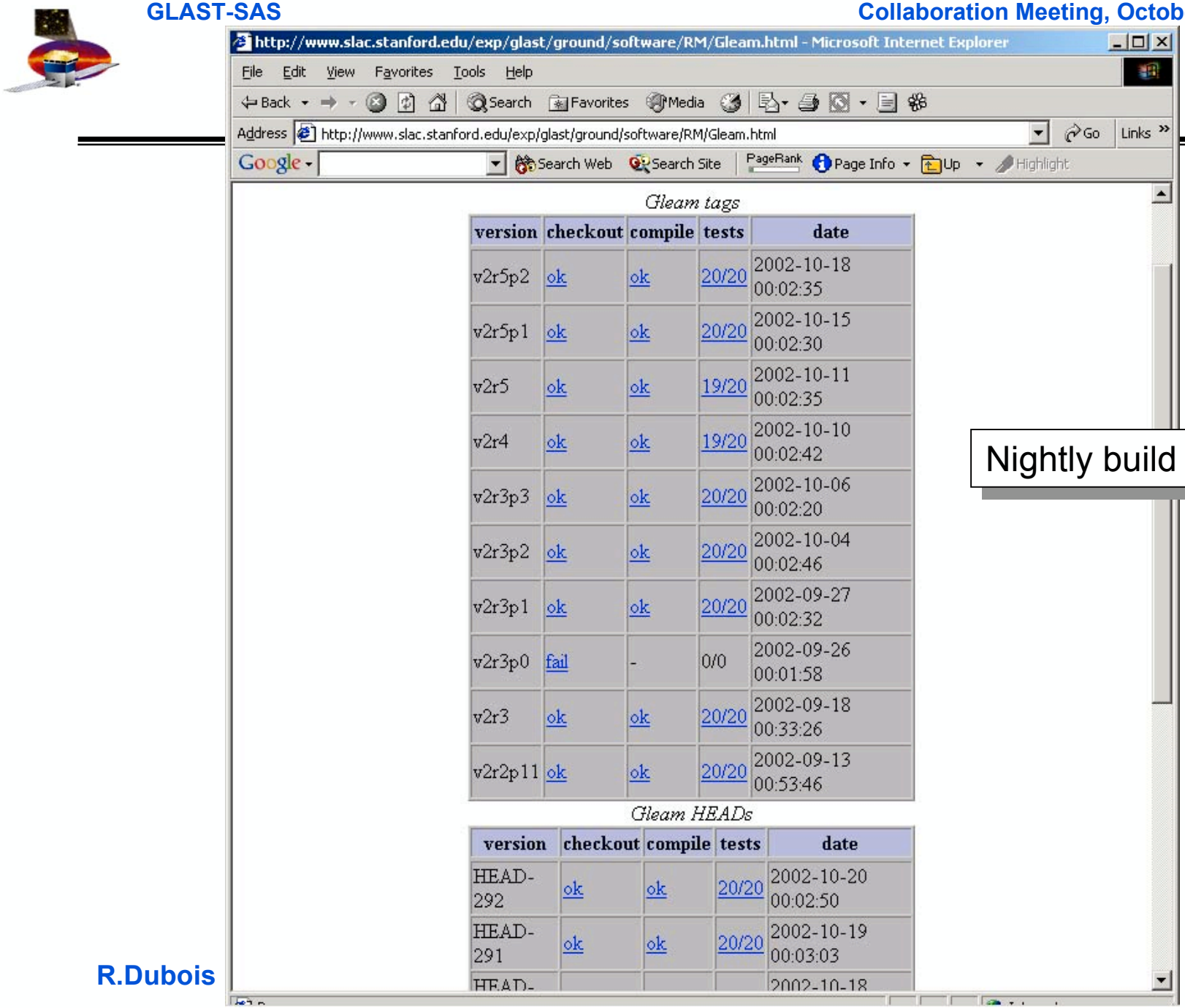
- **Expect release ~ end Oct**
  - **Had detailed subsystem performance reviews beforehand – Oct 16.**
- **ACD**
  - **Expected**
    - **rationalize row/column definition on top**
    - **make tapes detectors**
    - **revised TDS output for Recon**
    - **supply 'real' PHA in MeV (ie not just MC pass-through)**
  - **Not expected**
    - **efficiency maps across tile faces**
- TKR
  - **Expected**
    - **Bari (detailed) digis enabled; not default.**
    - **iteration on the TDS definitions**
    - **add VTX info**
    - **cleanup redundant variables**
    - **relational tables between digis/clusters**
  - **Desired**
    - **add some simple TOT, diffusion simulation in TkrSimpleDigiAlg.**

# Checklist (cont'd)

- CAL
  - Expected
    - correct position errors
  - Desired
    - recalculation of profile and last-layer correlation leakage corrections
    - complete recalc is unlikely; thinking about interim solution.
- G4/G4Generator
  - Expected
    - option to trim MC tree to remove CAL shower particles in "full" mode
    - "slab" test program to look at E-loss, multiple scattering etc in simple geometry
  - Desired
    - evaluate G4.41 relative to G4.32 to allow migration to later version for this release
    - Range cutoffs by region
- Merit
  - Expected
    - Tail cuts for PSF
    - initial set of PSF/Aeff ntuple variables in place
- Utilities
  - Expected
    - Relational table upgrade
    - Randoms control per shareable, reseedable per event
    - first system tests in place
  - Desired
    - persistent version of relational tables
- Doc/User Guide
    - Already have an initial guide

# Getting and Keeping It Right

- **Code Walkthroughs**
  - Subject all packages to periodic review
    - Seven done this year!
  - Coding & doc rules, etc.
  - Many sets of eyes looking at code
    - Two-way street – benefits to reviewers and ees.
- **Performance Reviews**
  - Prior to releases – first one done for upcoming v3 release
  - Subsystems show why they think their code is working
- **Nightly builds**
  - Anticipate and head off problems coming from the development areas
  - Build all tags, and HEADs of all packages
  - Run unit tests – notify package owners if problems found
- **System tests**




*Gleam tags*

| version | checkout | compile | tests | date |
|---|---|---|---|---|
| v2r5p2 | ok | ok | 20/20 | 2002-10-18 00:02:35 |
| v2r5p1 | ok | ok | 20/20 | 2002-10-15 00:02:30 |
| v2r5 | ok | ok | 19/20 | 2002-10-11 00:02:35 |
| v2r4 | ok | ok | 19/20 | 2002-10-10 00:02:42 |
| v2r3p3 | ok | ok | 20/20 | 2002-10-06 00:02:20 |
| v2r3p2 | ok | ok | 20/20 | 2002-10-04 00:02:46 |
| v2r3p1 | ok | ok | 20/20 | 2002-09-27 00:02:32 |
| v2r3p0 | fail | - | 0/0 | 2002-09-26 00:01:58 |
| v2r3 | ok | ok | 20/20 | 2002-09-18 00:33:26 |
| v2r2p11 | ok | ok | 20/20 | 2002-09-13 00:53:46 |

*Gleam HEADs*

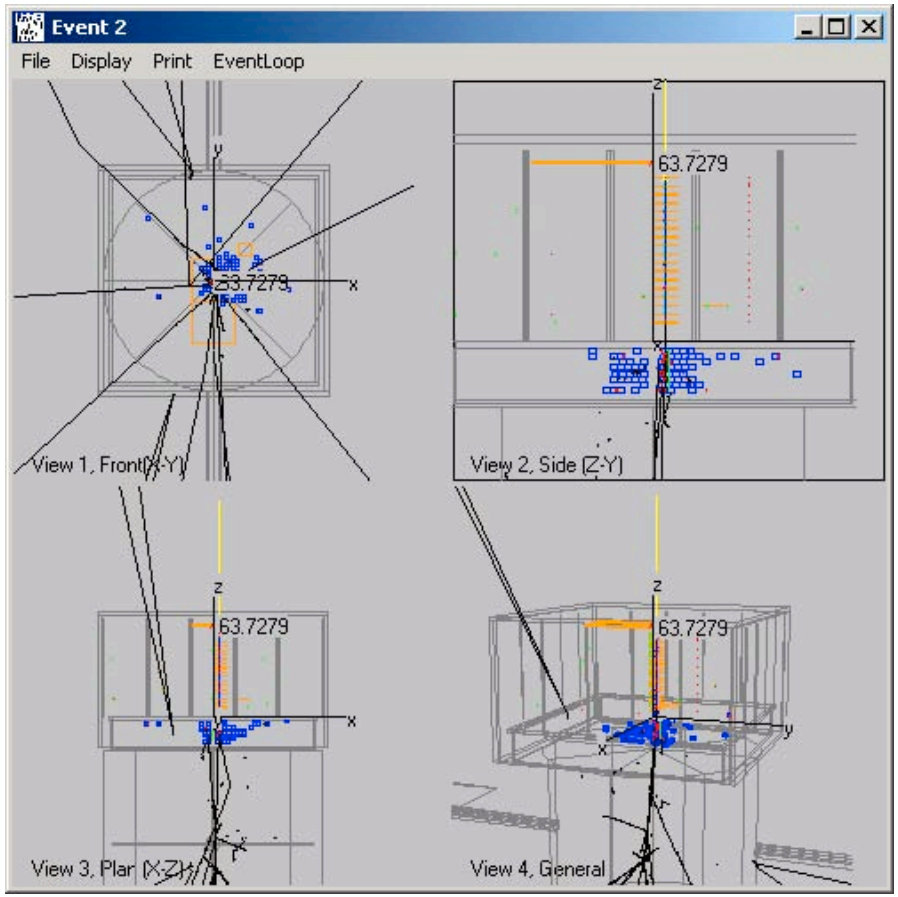
| version | checkout | compile | tests | date |
|---|---|---|---|---|
| HEAD-292 | ok | ok | 20/20 | 2002-10-20 00:02:50 |
| HEAD-291 | ok | ok | 20/20 | 2002-10-19 00:03:03 |
| HEAD- | | | | 2002-10-18 |

Nightly build summary

# Ad for System Tests Facility

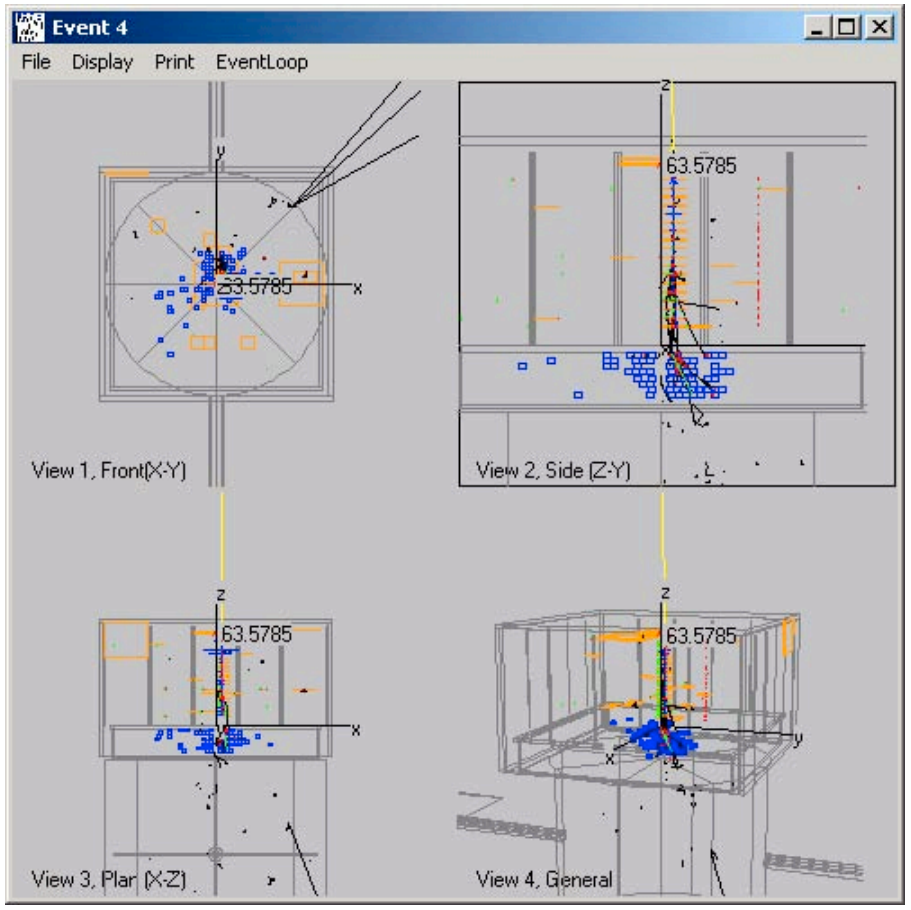
- Comprehensive tests producing histograms & diagnostic statistics
- A subset of the suite a subsystem would have for its own performance reviews
- Multiple test configurations possible
- Run on tags and releases
- Tracked in database with web plotting display capabilities
- Comparison to standards (deemed 'correct' by package owners)
- Tests to be discovered and run automatically by the code Release Manager
  - will capture results for the db

# Tests, Tests, Tests




10 GeV proton

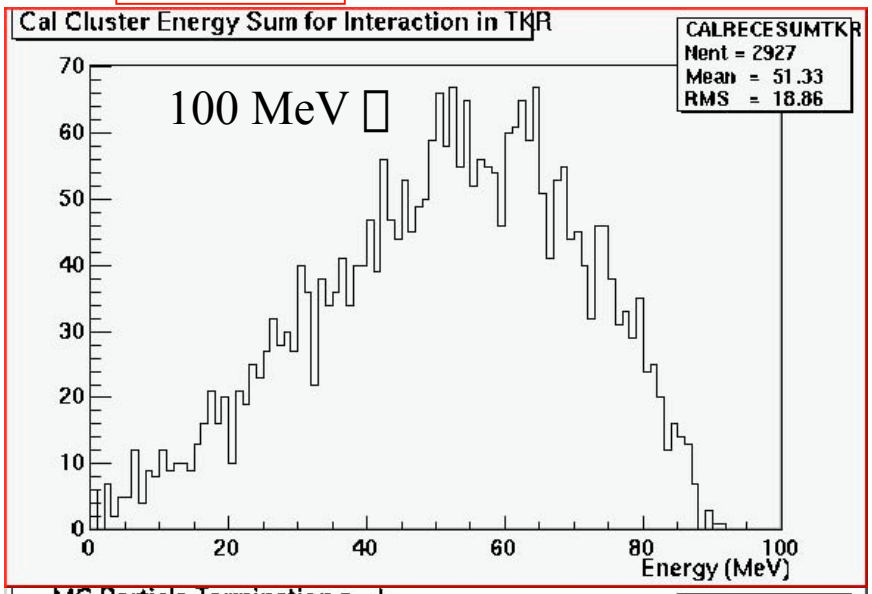
1 GeV gamma

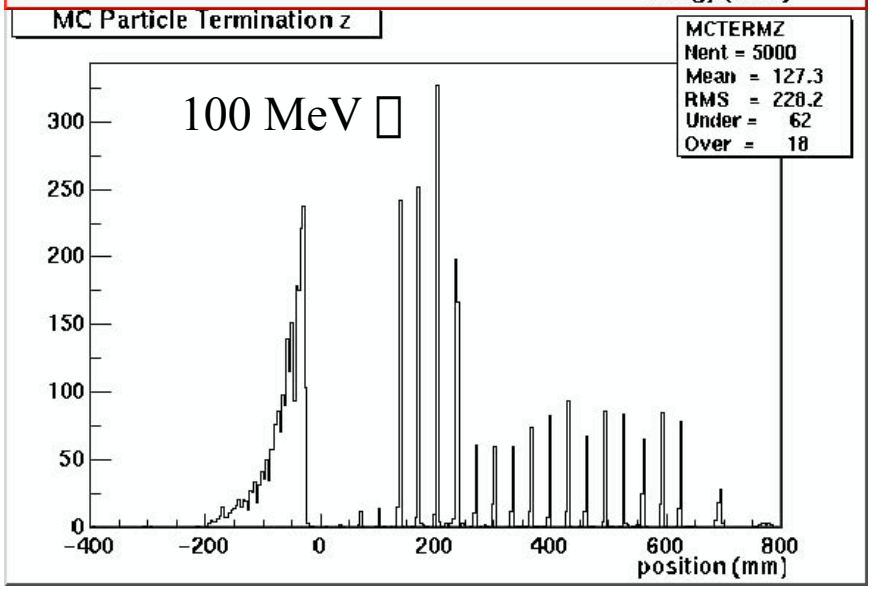



Use muons, gammas and protons at different energies and angles as test configurations: GLAST covers 20 MeV to 300 GeV!

# More Tests, Tests, Tests

**Detailed plots**




**Time, memory usage**

CPU time : 17056.34 sec.
Max Memory : 97 MB
Max Swap : 120 MB

TkrReconAlg:exe... INFO Time User : Tot= 47[min]
Ave/Min/Max= 1.81(+- 11.8)/ 0/ 268 [s] #=1557

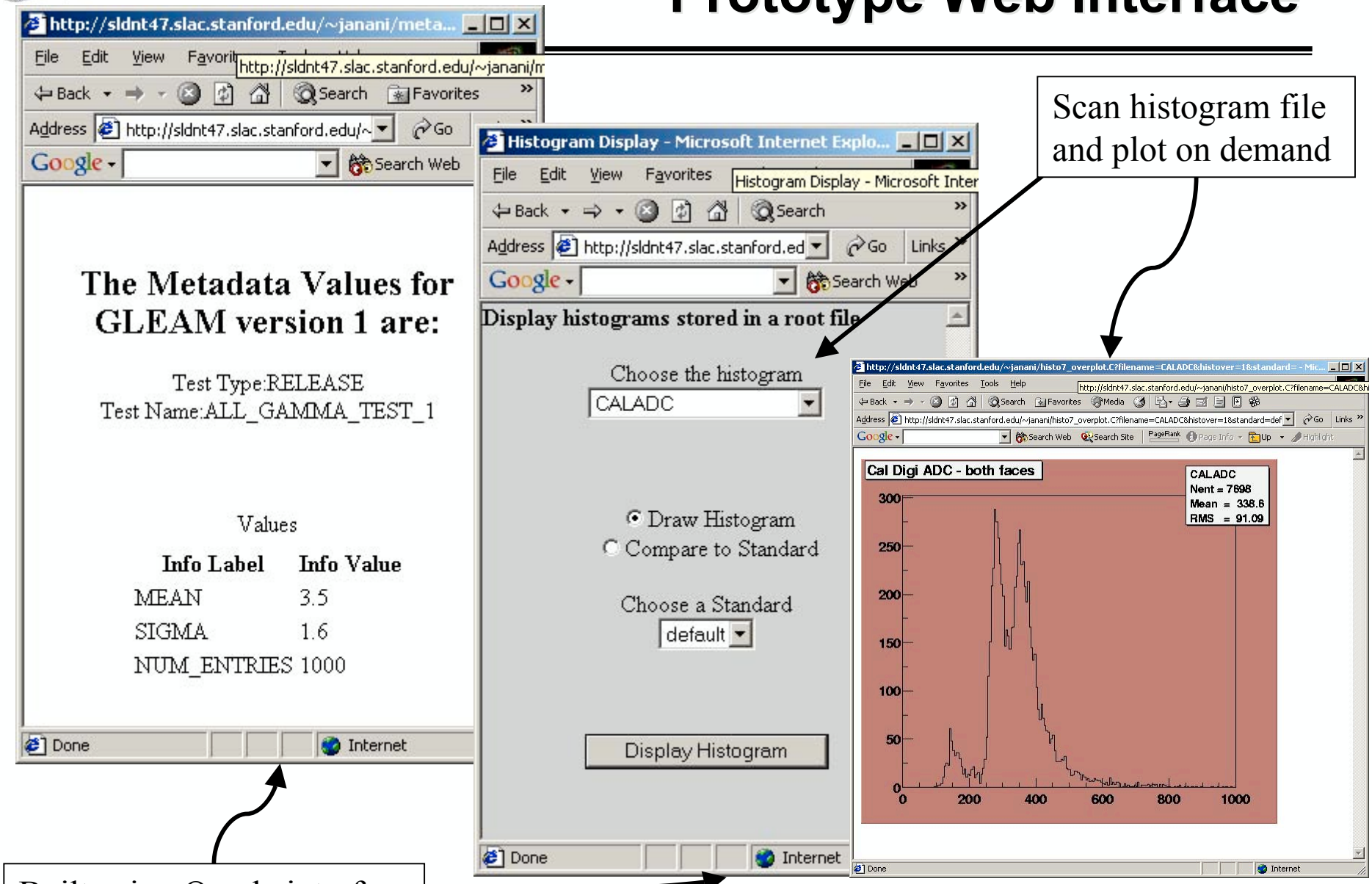
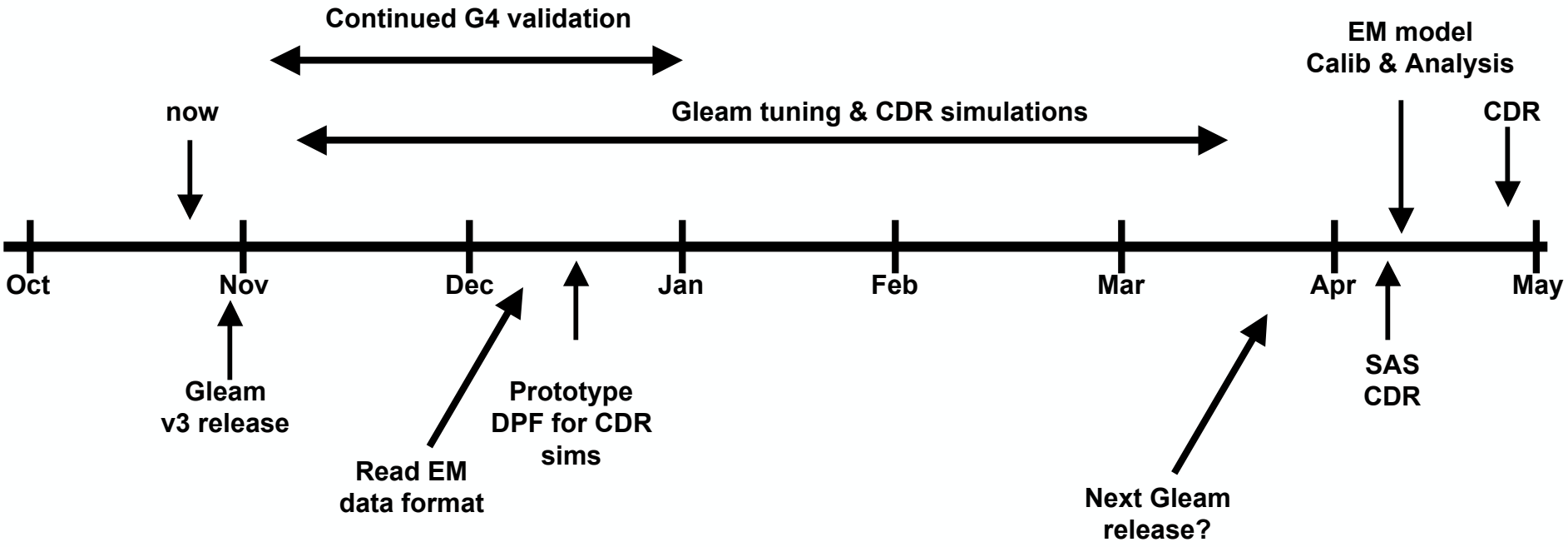
G4Generator:exe... INFO Time User : Tot= 110[min]
Ave/Min/Max= 1.31(+- 8.14)/ 0/ 126 [s] #=5000

ChronoStatSvc INFO Time User : **Tot= 165[min]** #= 1
*****Chrono***** INFO

**Reconstruction performance metrics: resolution and efficiency**

---------- Layers 12-15 Events used : 973
eff. proj. sigma : 4.08 deg = 245 arc-min
68% contained : 6.85 deg = 1.11*(1.51*sigma
95% contained : 18.1 deg = 1.81*(2.45*sigma
Energy: meas/gen :0.527
std : 0.196
events w/ no data : 20
effective area : 5838 cm^2
Figure of merit : 1074 cm
---
total effective area : 12066 cm^2
Combined FOM : 2409 cm

# Prototype Web Interface



# 6-Month Schedule