Introduction to Gleam

• Major release is imminent - end October
  – When
  – What to expect

• Quality Control

• Short & Longer term schedules
Data flow in Gleam

- Simulation Algorithms
- Source Generators
- Raw data
- Level 0
- Persistency Service
- Level 1
- Ready for astronomy
- MC
- Real Data

- G4
- Digitization Algorithms
- ACD, TKR, CAL
- Trigger
- Reconstruction Algorithms
- ACD, TKR, CAL
- R.Dubois
- Ntuple
- Ntuple Service
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.

R.Dubois
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.

R.Dubois
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

R. Dubois
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**
### Nightly Build Summary

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<tr>
<th>Version</th>
<th>Checkout</th>
<th>Compile</th>
<th>Tests</th>
<th>Date</th>
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### Gicam HEADs

<table>
<thead>
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<th>Date</th>
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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

R.Dubois
Tests, Tests, Tests

1 GeV gamma

10 GeV proton

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

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

TkReconAlg: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

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total effective area : 12066 cm^2
Combined FOM : 2409 cm
Prototype Web Interface

The Metadata Values for GLEAM version 1 are:

Test Type: RELEASE
Test Name: ALL_GAMMA_TEST_1

Values

<table>
<thead>
<tr>
<th>Info Label</th>
<th>Info Value</th>
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<tbody>
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<tr>
<td>SIGMA</td>
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<td>NUM_ENTRIES</td>
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Built using Oracle interface

Scan histogram file and plot on demand
6-Month Schedule

- **Now (Oct):** Gleam v3 release
- **Dec:** Read EM data format
- **Jan:** Prototype DPF for CDR sims
- **Feb/Mar:** Continued G4 validation
- **Apr:** Next Gleam release?
- **May:** SAS CDR

- **EM model Calib & Analysis**
- **CDR**