



# Data Challenge Planning Overview

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- **Purpose**
- **Boundary conditions**
- **Plan:**
  - **scope and progression of data challenges**
  - **schedule summary**
  - **implementation**

**This plan was generated in meetings with Richard Dubois, Seth Digel, Bill Atwood, and Steve Ritz. It has been discussed by the Analysis Group and the SSAC.**



# Purposes of the Data Challenges

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- **“End-to-end” testing of analysis software.**
  - **define the ends**
  - **define the tests (what is success?)**
- **Familiarize team with data content, formats, tools and realistic details of analysis issues (both instrumental and astrophysical).**
- **Develop additional methods for analyzing GLAST data, encouraging alternatives that fit within the existing framework.**
- **Provide feedback to the SAS group on what works and what is missing from the data formats and tools.**
- **Uncover systematic effects in reconstruction and analysis.**

**Support readiness by launch time to do all first-year science.**



# Realities, Boundary Conditions

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This meeting!

- **Still much to do on GLEAM to be ready:**
  - geometry review
  - underlying physics review
  - embed onboard filter
  - other infrastructure (compilers, package versions, etc.)
  - **Check, check, check everything!!**
  - finish implementing remaining gamma source fluxes
- **Still much to do on instrument analysis to be ready:**
  - background rejection
  - performance evaluation and parameterization
  - See Bill Atwood's talk
- **Still much to do on science tools to be ready**
  - See Seth Digel's talk tomorrow
- **Lots of other work demanding attention:**
  - Reviews...
  - EM support
  - Other calibration planning and development
  - Construction, Integration, and Test planning and execution



# Approach

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- **Use the September collaboration meeting as the start of the Data Challenges.**
- **Walk before running: design a progression of studies.**
  - **DC1. Modest goals to work out problems. Mainly use existing recon tools to explore where improvements could be made. Contains most essential features of a data challenge (see following slides).**
  - **DC2. More ambitious science goals. Encourage further development within the existing structure, based on lessons from DC1.**
  - **DC3. Support for flight science production.**



# Preparatory Work

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- **Preparation complete by September collaboration meeting:**
  - complete geometry review
  - preparatory work meeting: [THIS MEETING](#)
  - complete embedding, verification of filter, evaluate: July
  - Simulation hard freeze date – TBA (needed soon!).
  - first new background rejection/performance analysis July & August
  - sky model fluxes implementation complete September 1
- **At Collaboration meeting:**
  - first, PRELIMINARY instrument response functions presented
  - DC1 kickoff (see following slide)
  - small workshop on using tools for team



# Data Challenge Progression

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- **DC1**
  - **modest goals:**
    - 1 simulated day all-sky survey simulation (3M bkgd+gamma events to ground, => 400M generated events)
    - find flaring AGN, a GRB
    - single-day point source sensitivity. daily quicklook analysis development.
    - recognize simple hardware problem(s)
    - a few physics surprises
    - exercise:
      - exposure, orbit/attitude handling, data processing pipeline components, analysis tools
    - use existing recon, bkgd rejection and instrument response to show the problem areas that need improvement. secondary goal (not required) is to prototype improvements
  - **baseline schedule:**
    - Sept-Oct startup problems resolution.
    - Nov-Dec high-level tools beta testing. Finalize instrument response functions.
    - Dec 15 high-level tools release, workshop.
    - mid-January: interim reports (vrvs or face-to-face)
    - Feb 2004 closeout, and plan for DC2 (see following slide).
    - Then, break for I&T prep. Use the time for fixing problems learned in DC1, software advances, etc.



# DC Progression

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- **DC2**
  - **more sophisticated goals:**
    - 1 simulated month all-sky survey simulation (100M bkgd+gamma events post-filter. Method TBD) PLUS 1 simulated year of gammas
    - find AGN, bursts, pulsars
    - produce a toy 1-month catalog
    - detailed point source sensitivity and localization analyses
    - recognize more subtle hardware problems
    - a few more physics surprises
    - **exercise:**
      - exposure, data processing pipeline, analysis tools, quicklook. benchmark processing times, data volume, etc. connect to SSC.
    - use updated recon, bkgd rejection and instrument response to show the problem areas that need work. encourage improvements
  - **tentative schedule:**
    - freeze software version July 04. start generation in September
    - start DC2 October 2004 (beam test analysis ~complete)
    - Dec 15 2004 midterm reports milestone
    - Feb 2005 closeout, and plan for DC3 (see following slide).



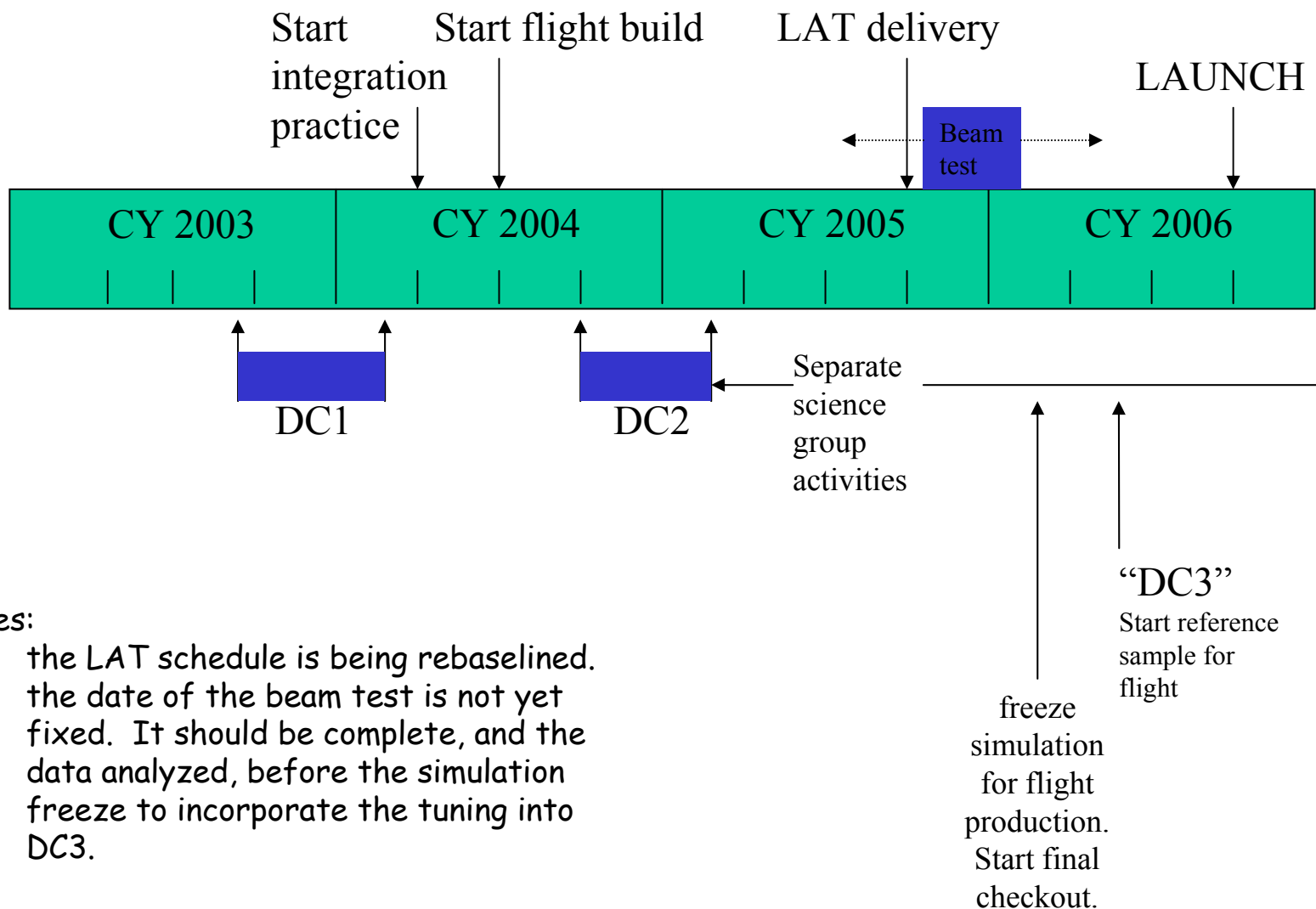
# DC Progression

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- **“DC3” – Flight Data Challenge!**
  - physics groups will have been working on detailed analyses, based on experience with DC2, during the previous year.
  - main goal is realism to support running experiment analysis:
    - 1 full simulated year of data (methods TBD)
      - exercise everything: format data as it comes into the IOC. also confirm data storage, backup, processing speed. will be the reference sample for 1<sup>st</sup> year data analysis.
    - connect to SSC
    - demonstrate point source sensitivity and localization
    - recognize a few very subtle hardware problems. recognize a few realistic daily hardware problems -> feed to IOC and FSW.
    - physics surprises
    - use updated recon, bkgd rejection and instrument response. this will be our initial science performance. by this time, physics analysis groups should be up and running.
  - schedule:
    - freeze software version Feb 06. This is the first year flight version! start generation in May.
    - physics groups working
    - launch.



# Schedule Summary



## notes:

- (1) the LAT schedule is being rebaselined.
- (2) the date of the beam test is not yet fixed. It should be complete, and the data analyzed, before the simulation freeze to incorporate the tuning into DC3.



# Implementation Suggestions

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- **A small organizing committee (~3-5 people) should be put into place by the PI for DC1. Each person on the committee should have a clearly defined set of responsibilities for coordinating and overseeing the components of the work.**
- **The organizing committee should have a well-defined, prioritized list of plots and other results to be produced by data challenge participants.**
- **Review lessons from DC1, and re-evaluate scope and schedule for DC2 (and DC3) as appropriate.**



# Needed results from this meeting

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- **Checklist on remaining work.**
  - **dates, people responsible**
- **Sanity check on schedule.**
- **Fill in the holes! Especially need help checking, debugging infrastructure; thinking things through.**
- **Many other interesting SAS issues to discuss; however, for the data challenge to be possible, we must stay on topic at this meeting.**
- **Eye on the ball.**