Automated Science Processing

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ASP Summary

- ASP is intended for **time-critical science** analysis tasks and so explicitly excludes tasks related to instrument performance monitoring and science analysis that is not time critical, such as blind pulsar searches.
- Inputs consist of Level 1 and possibly GBM data.
- Analysis is performed with ScienceTools, FTOOLs, and similar packages.
- Outputs comprise deliverables to the user community (e.g., GCN notices, source fluxes, source locations, etc.) and data products for further analysis by the collaboration.

ASP Tasks

1. **Gamma-Ray Burst (GRB) Analyses.** GRB time scales $< \mathcal{O}(10)$ s; "expected" number of LAT photons $\mathcal{O}(10)$–$\mathcal{O}(10^2)$.
   (a) Refine parameters (position, time, duration) for GRBs detected on-board by the LAT.
   (b) Refine parameters for GBM (or GCN) detected bursts (but not detected on-board).
   (c) Perform blind searches for GRBs in L1 data (not detected on-board, by the GBM or GCN).
   (d) Search for afterglows of detected bursts in LAT data on time scales of 10s of minutes to hours or longer (diffuse and instrument backgrounds must be considered).
2. **Flaring Source Monitoring.** Time scales of several hours to days or longer.
   (a) Monitoring of a predefined list of sources. LAT Data Release Plan (DRP) presently calls for 11 (3EG) + 8 AGNs, 1 NS-Be binary system.
   (b) Search for new transients and report if flux exceeds $2 \times 10^{-6}\mathrm{cm}^{-2}\mathrm{s}^{-1}$ s (DRP), presumably above 100 MeV.

Implementation

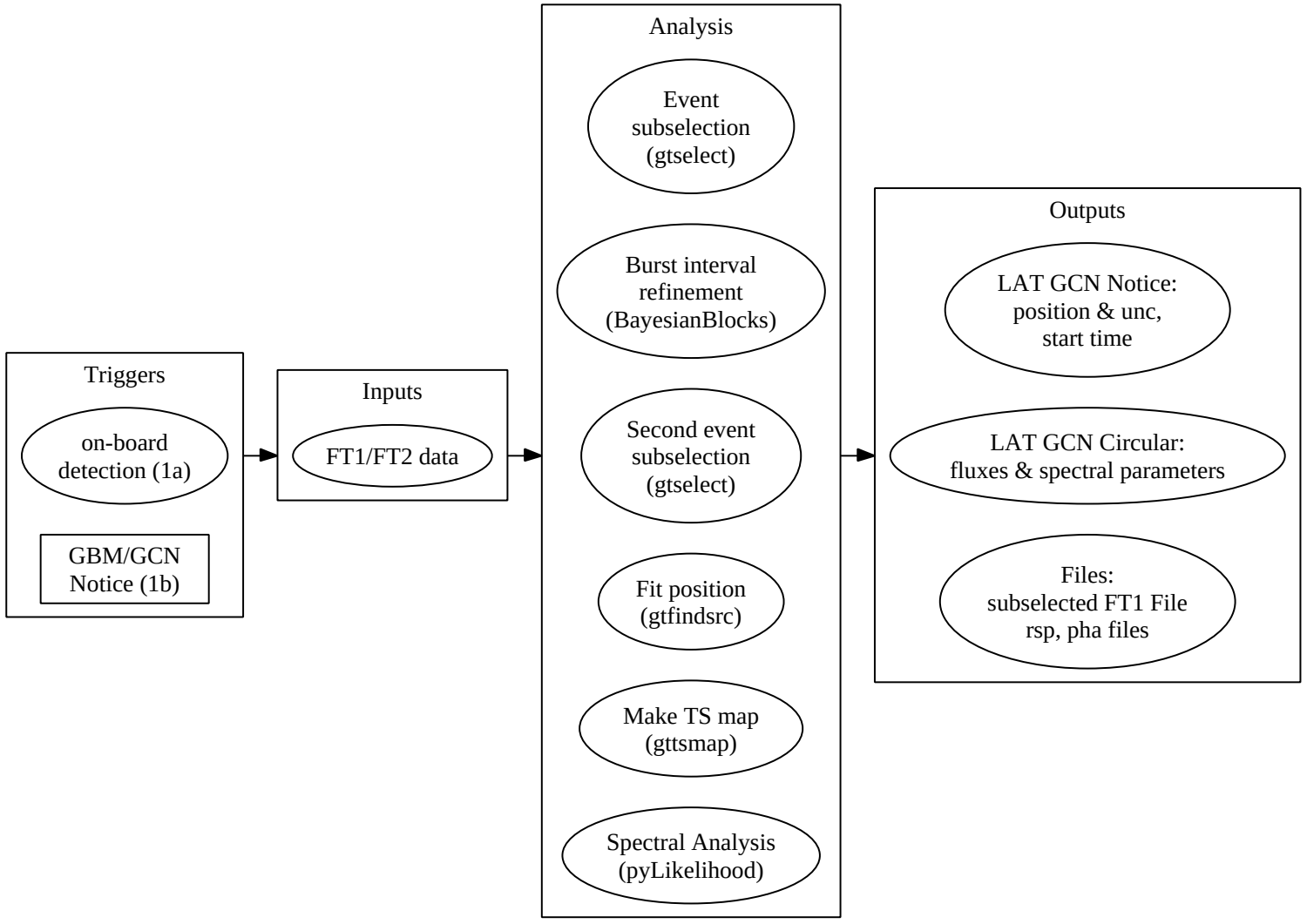
- Python scripts to drive ScienceTools, FTOOLS, etc.
  Two packages live outside of ST:

  pyASP The Python scripts themselves (plus some SWIG-exposed classes from astro, etc.)
  `http://glast.stanford.edu/cgi-bin/viewcvs/users/jchiang/pyASP/`

  BayesianBlocks Python module (implemented in C++) for performing temporal analysis.
  `http://glast.stanford.edu/cgi-bin/viewcvs/users/jchiang/BayesianBlocks/`

- Pipeline II to drive the scripts given various triggers/inputs.
- Examples:
  - Refining GRB parameters
  - GRB Blind Search

- Refining GRB parameters



- GRB blind search