Wrap-up: Science Tools

What we got done at the meeting
What needs to get done
Getting to DC1
Who is doing what?

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What got done at the meeting

- **Talks**
  - You heard them, too

- **Working sessions-type topics**
  - **Observation simulation**
    - Simulated data sets, variable (periodic) sources, handling multiple classes of events; Claudia Cecchi will be coordinator of obs. sim. science tools with Jim Chiang
  - **Graphics – AIDA & Plplot**
    - Round table forum. We’ve talked ourselves out of AIDA (too much overhead just for plotting) and raw Plplot, may be talking ourselves into ROOT
  - **HOOPS – how-to**
    - How went?
  - **Data layer – core developer-level discussion: what it can do for you**
    - Binned event class (data type) implemented; need one or two more for GOODI to be useful for the DC1 science tools
  - **D1 & D2 details – like how to communicate with them**
    - How went? Beowulf at SLAC has been rediscovered with Julie McEnery’s help
What got done (2)

- **Source detection**
  - Variable/moving sources, tradeoffs in response functions, computation time; N-dim Bayesian blocks, ICA, wavelet, other alternative methods for source detection?
- **Interstellar emission model**
- **D3**
  - Parameterization of response functions, interface work
- **Data products**
  - ICD between IOC and SSC; L0.5 data
What needs to get done

- [Out of our hands] Derivation of LAT response functions
  - Parameterizing them, studying them for likelihood analysis, will be in our hands
  - Biggest concern in terms of the end-to-end goal of DC1
  - For DC1 goals (at least as far as science tools go), we could get by with GLAST25 response functions and our high-level simulators

- D1 & D2
  - For D1, need to converge on contents. Sensible suggestion: include the variables that are input to the classification trees [although then would have to include ‘flattening’ information]
  - For development, keeping up on the LAT side is the issue

- Likelihood tool
  - Source model definition, commanding, user documentation
  - Wilks’ theorem?
What needs to get done (2)

• Observation simulation
  – obsSim & Light Simulator cross check
  – Basically close to where we want to be for DC1; livetime <> real time; read D2 output

• Map generation
  – Can DS9 do what we want? Maybe with exposure calculation utility

• L1 pipeline
  – Waiting for OPUS code; in the meantime can work on the scripts that we’ll feed opus
  – We’ll want to provide input regarding the ‘Monte Carlo Truth’ sky

• Core
  – Graphics – what tools need it for DC1?
  – HOOPS and GOODI – really should be in there; don’t foresee that this will be a problem
What do we need from DC1?
- Technical aspects
- Also to get software in a state where non-developer users can use it
  - install it, understand it, run it

For collaboration meeting in September, need to introduce the DC1-era science tools

WBS says that we will have a month of testing our tools in advance of release (pipeline → D1 & D2 → likelihood analysis (with exposure calc.) → (pseudo)science

‘Release’ means more than a tag
Who is doing what?

- **Core – Science Tools Core**
  - Development environment, release manager
  - HOOPS (OO PIL)
  - GOODI – data representation, i/o
  - Plplot/AIDA

- **D1 database and supporting utilities** – DB & related utils

- **D2 pointing/livetime/mode history** – DB & related utils

- **D3 response functions, form and interface** – Davis & ?

- **O1 orbit and attitude simulation** – Obs. sim

- **O2 & interim simulated data set** – Obs. sim

- **A1 & supporting tools**
  - Functional prototype likelihood analysis – Chiang, Source detection
  - Source model definition - ?
  - Exposure calculation? – Chiang, Source detection
  - Response function visualization - ?

- **Map generation** – counts, exposure, intensity, model - ?
Components of the Standard Analysis Environment

User Interface aspects of the standard analysis environment, such as Image/plot display (UI2), Command line interface & scripting (UI4), and GUI & Web access (UI5) are not shown explicitly.

1 This tool also performs periodicity tests and the results can be used to refine ephemerides
2 These tools can also take as input binned data from other instruments, e.g., GBM; the corresponding DRMs must also be available.