Summary of Science Tool development directions

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This page subjectively summarizes Science tool development directions, making some recommendations about what should be done in each area taking into account the limited time and limited number of developers.

Likelihood analysis

- A new ModelEditor-like tool that can generate and translate between **gtobssim** and **gtlikelihood** models, and uses the st_graph package, is recognized as useful. However, development support for this withing the GSSC does not look possible in the near term, with the focus increasingly on user/proposal support tools.
- Regarding pointed observations, Jim's suggestion about excluding times when zenith angle cuts would be necessary has a lot of appeal, not least of which that it could be done via GTIs.
- Other potential developments - like a 'hybrid' of binned and unbinned analyses - do need to be explored as part of ongoing development of likelihood. This is not a show stopper
- The interpretation of test statistic values in terms of significances, and procedures for defining upper limits, need more work. I'm beginning to think that this will have to be based on simulations rather than an analytical prescription.

GRB analysis

- Some **XSPEC** functions for GRB analysis at LAT energies should be defined - this does not sound like a major job
- **gtburstfit** needs to be updated to handle unbinned counts; this also does not seem like a major job.
- A deadtime correction tool probably should be implemented, possibly even just as an option within **gtbin**. Except for GRBs that span the boundary between runs, this is probably straightforward. Deadtime corrections will be important only for the very brightest bursts (and solar flares)

Pulsar analysis

- Masa and James seem to be well on the way to having a workable blind search tool.
- From a science tools user perspective, the rest of the development work seems to be in plotting results, especially if **gtselect** can be modified to allow energy-dependent ROI cuts
- Analysis of binary pulsars will have to be tested, of course once the simulations are reach

Observation simulation

- I don't think we can realistically develop a realistic orbit/attitude simulator for distribution with the science tools. **gtorbsim** is probably fine for many purposes, and for scanning observations precomputed and long FT2 files can be generated by whatever high-powered code we have behind the scenes and made available.
- Toby is close to having sun and moon sources.

Utilities

- I have heard that Analia has a PSF profile plotter. Also, Jim's irfLoader could be used to make a more general tool for looking at IRFs. Currently this is not covered
- Jean-Marc Casandjian is working on a tool to make 'EGRET-like' exposure maps
- Jim has a tool that can make exposure corrections for binned counts light curves.
- The GUC comments include some useful-sounding capabilities, like having gtselect understand ds9 regions for selection, but these are not must-haves. Their points about unifying prompts between tools is important.
- We've talked for a long time about having a GUI front end to the goods, something more integrated than the automaticly-generated panels that can be enabled for each too. Obviously doing this right would not be easy. I don't see momentum on this topic and I'm willing to assume that we won't have such a front end, at least not initially.
- How does the GSSC feel about the event display tool?