# Pass 8 Data Public Release

Jeremy S. Perkins for the LAT and the FSSC

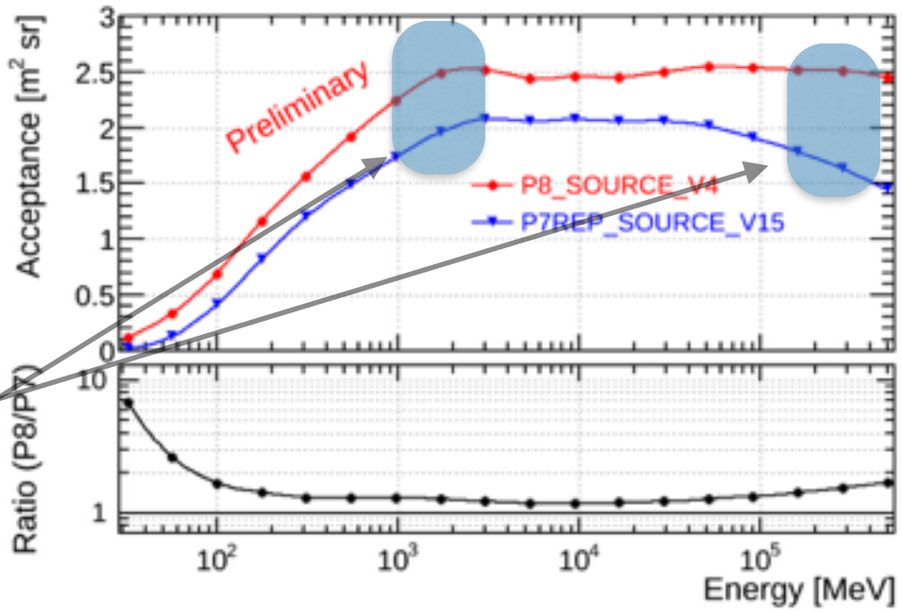
**Outline**

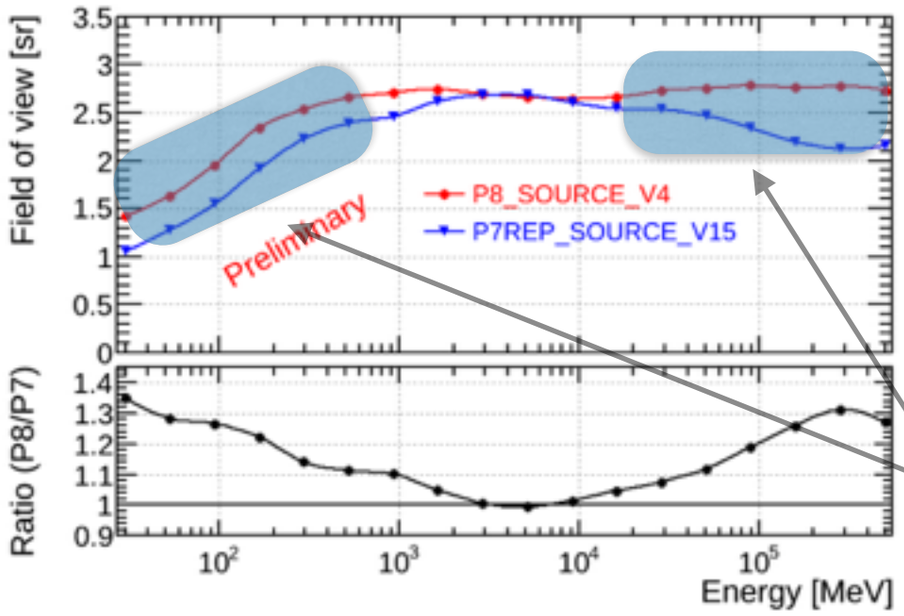
- Pass 8 Performance Status
- L1 Processing Switch
- Science Tools Related Updates
- Pass 8 Package and Analysis Recommendations
- Timeline

# Pass 8 Performance

- Significant improvements over Pass 7
- No significant changes over what was reported at the *Fermi* Symposium
- Currently validating the full Pass 8 Package and planning for the processing switch

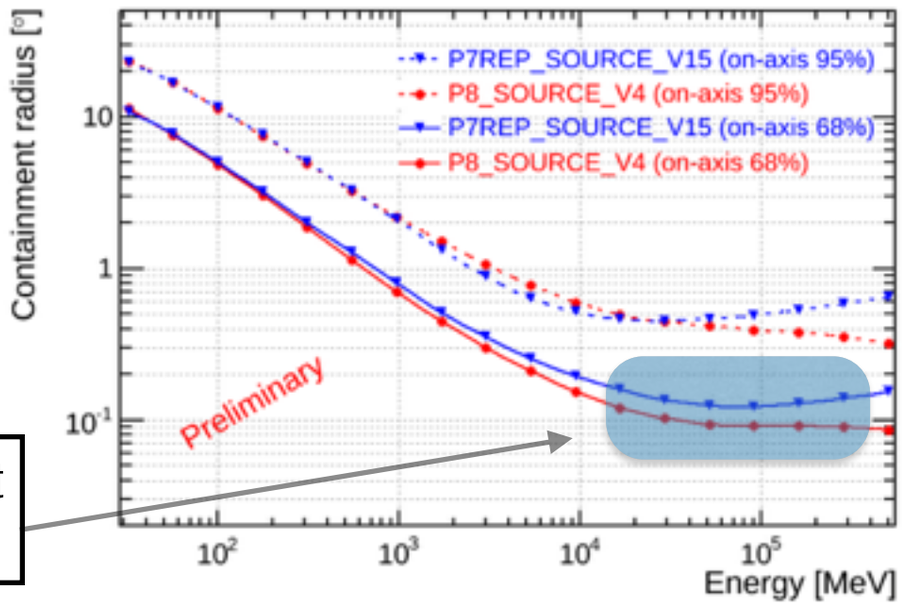
25 - 40% increase in acceptance

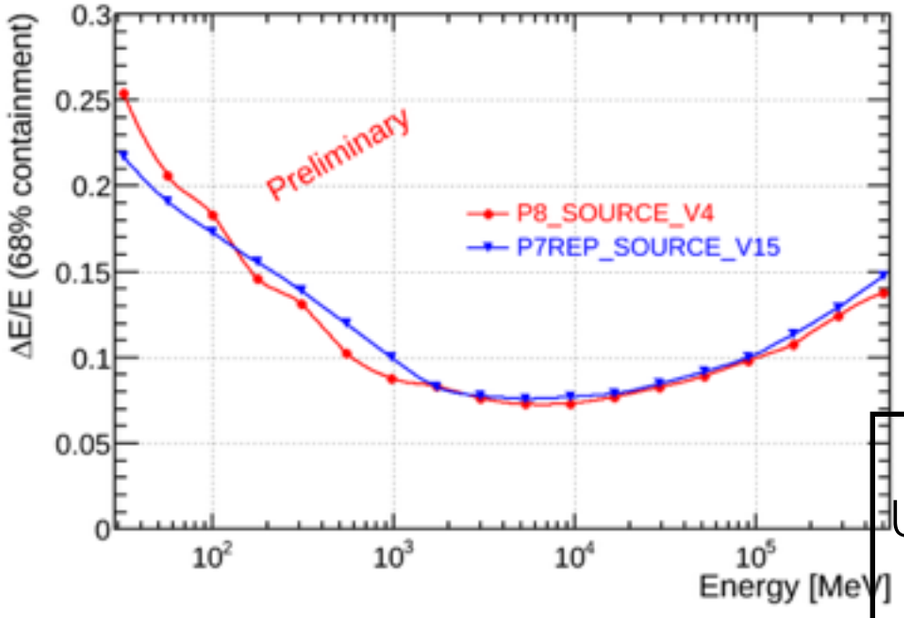



Larger Field of View

Improvement in the PSF




Better Understanding of the Systematics

# L1 Processing Switch

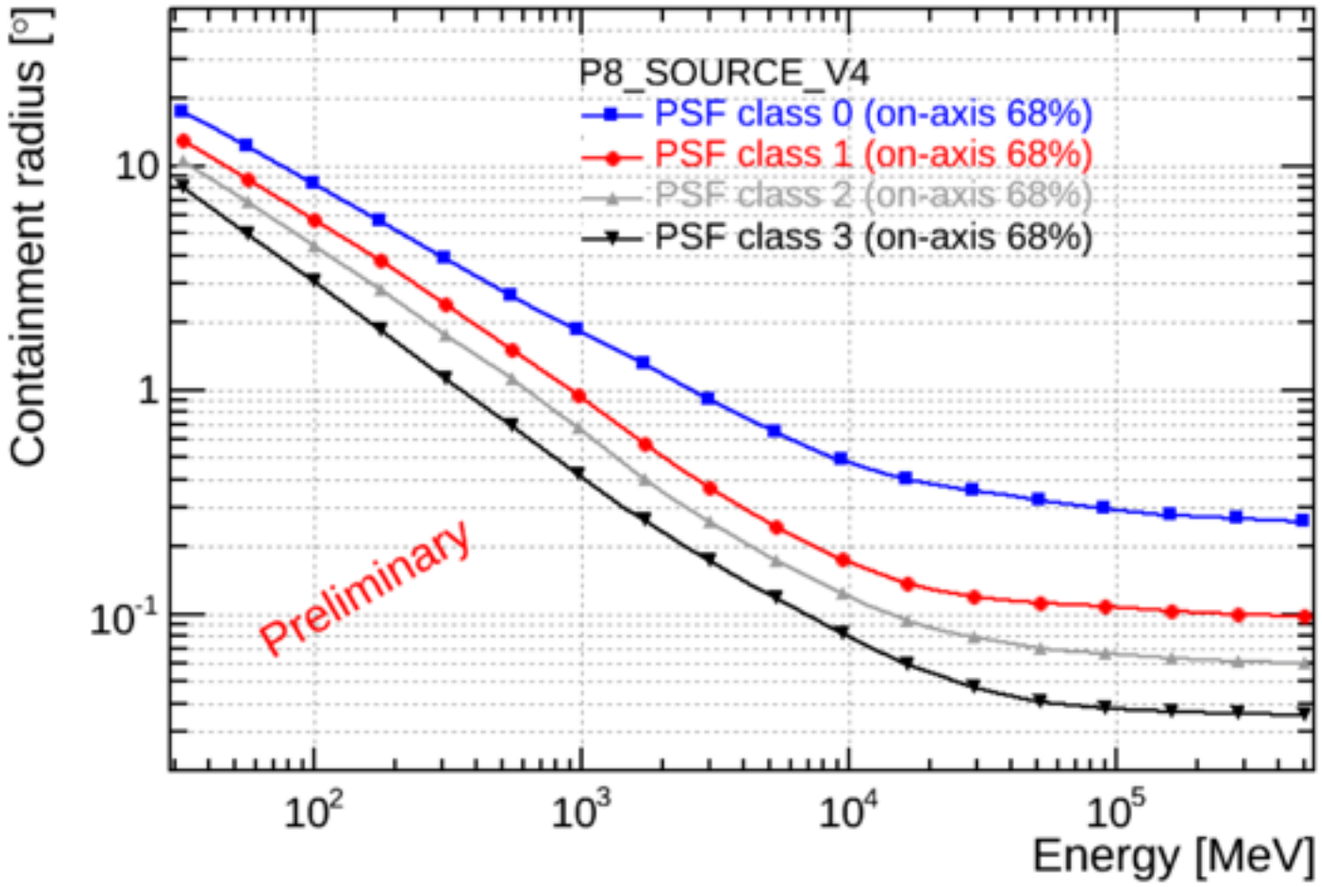
**Current Situation**
Level 1 (L1) Processing with P7Rep
&
Reprocessing with Pass 8

**L1 Switch**
L1 Processing switches from P7 Rep to Pass 8
*This is a major event (which we've done before)*

**P7 Rep data will no longer be available (to the LAT team or at the FSSC)**
We have to ensure that we are still able to perform our science monitoring tasks (i.e. GRB detection/Solar Flare detection/AGN flares/Galactic Transients). We need to make sure that we are not blind to the High Energy Sky.
**L1 Processing is more comprehensive than simple reprocessing with Pass 8**
**L1 includes Data Quality Monitoring (DQM)**
We monitor many variables to ensure the LAT is operating effectively. Many of these were changed with Pass 8 and this monitoring is nominally based on their expected values which depend on orbit position and event selection
**Additionally, we are dealing with infrastructure modifications**
Includes switching from rhel5-32bits to rhel6-64bits which requires consistency verification

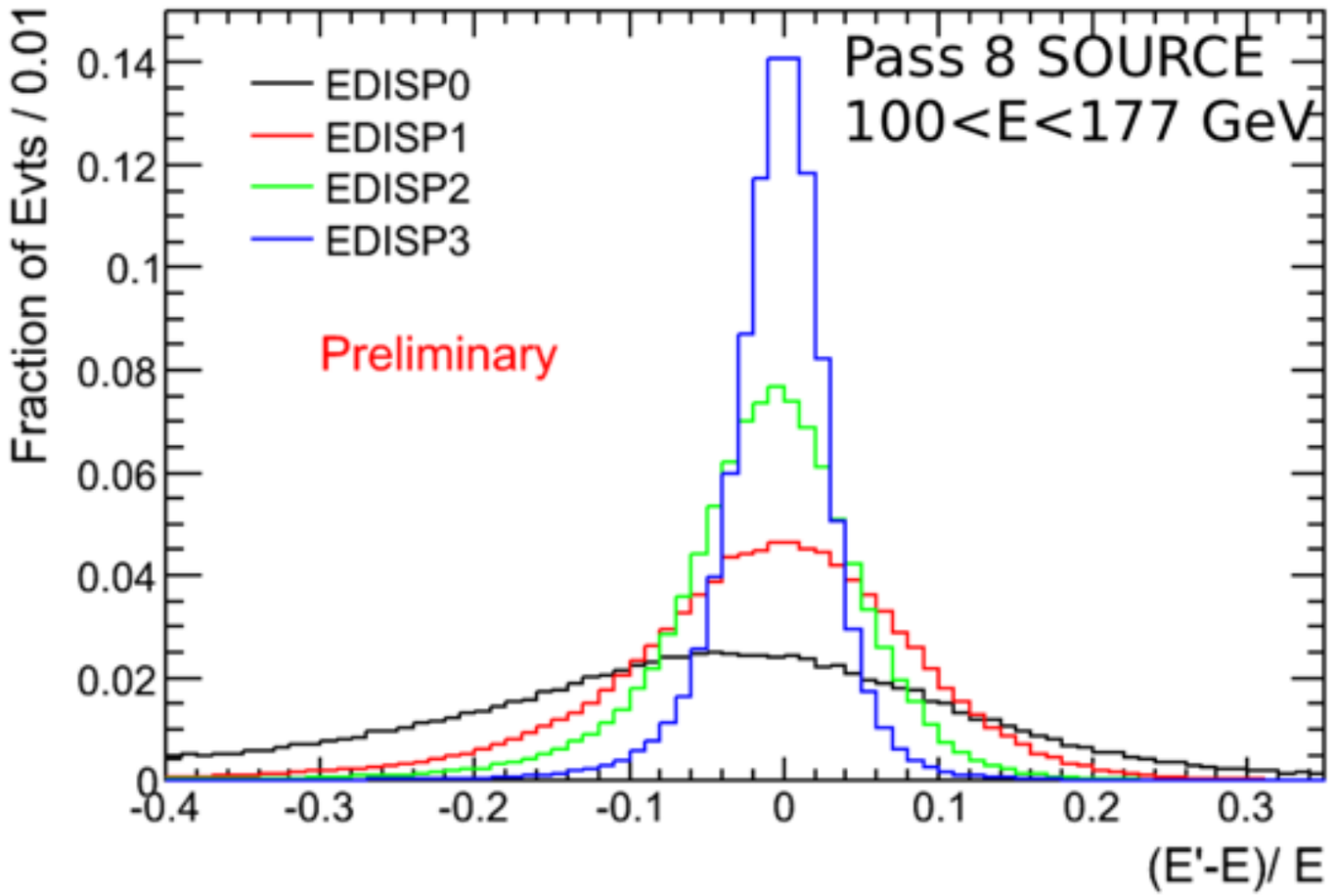
# New: Event Types

- Recall: in P7 Rep the event classes (TRANSIENT, SOURCE, …) are partitioned into conversion types (FRONT/BACK).
- In P8, we have generalized this into what we are calling ‘event types’:
  - FRONT/BACK
  - PSF0/1/2/3: direction accuracy partitions
  - EDIPS0/1/2/3: energy resolution partitions
- FRONT/BACK are still there; users can continue to do a P7 Rep type analysis
  - But, using the four PSF types yields a ~10% sensitivity improvement (you are inputting more information into the likelihood); we are developing tools and methods to provide an easy way to perform a joint analysis.




Can use these separately or in a joint likelihood.

Split into event types by equal acceptance.



# Science Tools Updates

- Event Types introduction has increased the analysis phase space
  - You can choose to use only 1, 2 or 3 event types
  - You cannot mix different families of event types
- Consistently using the correct IRFs throughout the analysis chain is challenging and important
- In order to minimize error the STs have been modified to ensure the correct IRFs are used
  - During the selection step (gtselect) the selection keywords are recorded in the FITS file.  This record is used further down the analysis chain to determine if the correct IRFs are being used.
  - This works seamlessly with CALDB.
  - This functionality is currently being tested at SLAC and the FSSC

# Pass 8 Package

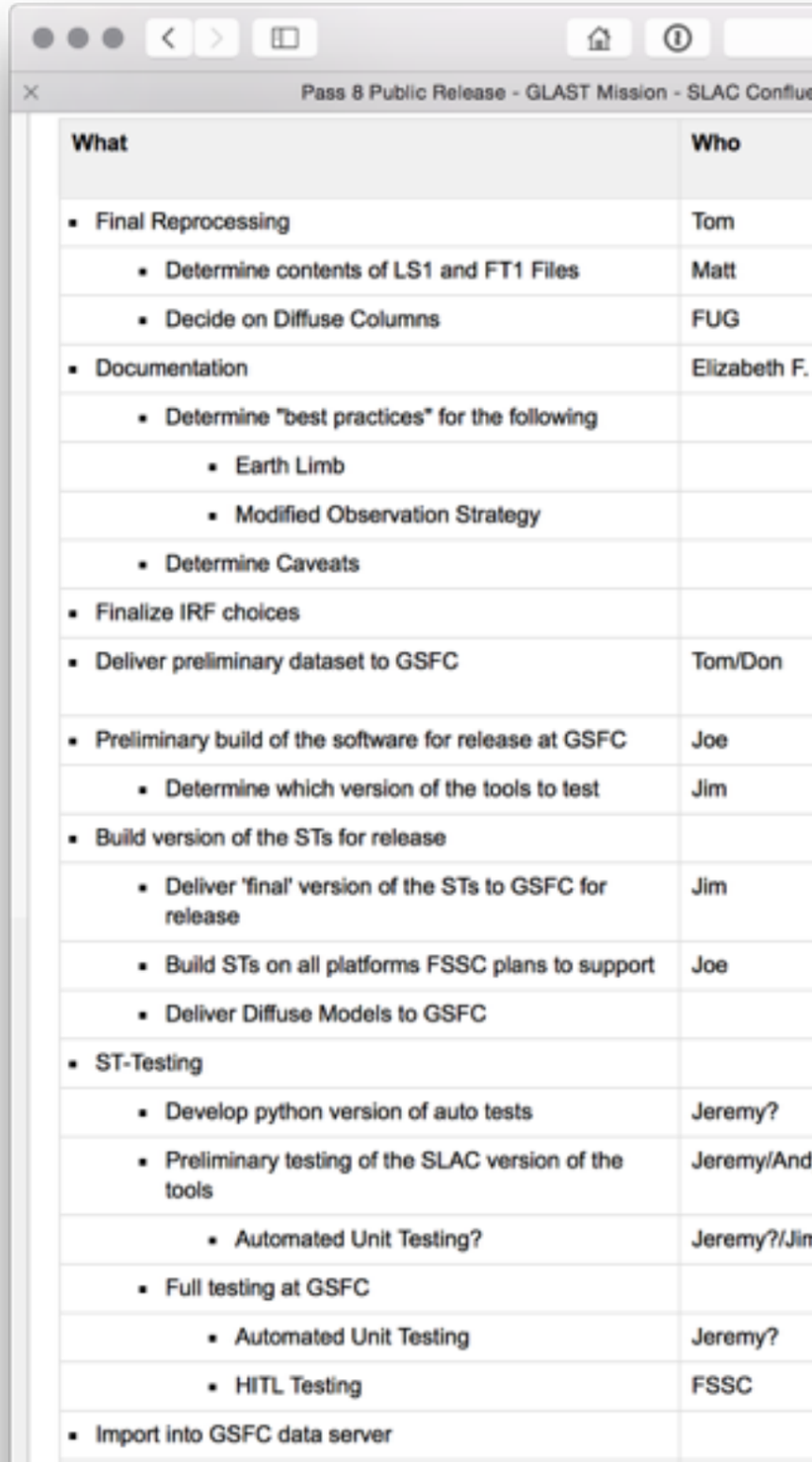
| | |
|---|---|
| Serving Size 424 Million Events | |
| **Event Classes** | |
| Transient | Standard |
| Solar Flare Transient | Less X-ray pile-up in ACD |
| SOURCE,CLEAN,ULTRACLEAN | |
| **Interstellar Emission Model** | |
| Scaled P7Rep with Energy Dispersion | |
| **Isotropic Templates** | All Event Types/Classes |
| **Earth Limb Template** | |
| **Systematics** | |
| **Initial Conservative Recommendations** | |
| Energy Threshold | |
| Earth Limb Handling | zenith angle cut,… |
| **Updated Recommendations** | ~ 6 months after release |
| Our understanding of Pass 8 continues to evolve | |
| **Documentation** | Threads, Guides, Details |
| **Analysis Scripts** | ~ 6 months after release |

# Timeline

- We have made tremendous progress since the *Fermi* Symposium getting all of the pieces ready.

- Our recommendations will be finalized during the next LAT collaboration meeting March 16 - 20.

- We estimate a release date of March 31st.



Pass 8 Public Release - GLAST Mission - SLAC Conflue

| What | Who |
|---|---|
| Final Reprocessing | Tom |
| Determine contents of LS1 and FT1 Files | Matt |
| Decide on Diffuse Columns | FUG |
| Documentation | Elizabeth F. |
| Determine "best practices" for the following | |
| Earth Limb | |
| Modified Observation Strategy | |
| Determine Caveats | |
| Finalize IRF choices | |
| Deliver preliminary dataset to GSFC | Tom/Don |
| Preliminary build of the software for release at GSFC | Joe |
| Determine which version of the tools to test | Jim |
| Build version of the STs for release | |
| Deliver 'final' version of the STs to GSFC for release | Jim |
| Build STs on all platforms FSSC plans to support | Joe |
| Deliver Diffuse Models to GSFC | |
| ST-Testing | |
| Develop python version of auto tests | Jeremy? |
| Preliminary testing of the SLAC version of the tools | Jeremy/And |
| Automated Unit Testing? | Jeremy?/Jim |
| Full testing at GSFC | |
| Automated Unit Testing | Jeremy? |
| HITL Testing | FSSC |
| Import into GSFC data server | |