



Fermi

Gamma-ray Space Telescope

# Data Archive & Software Development

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FSSC Archive and Data Operations Manager

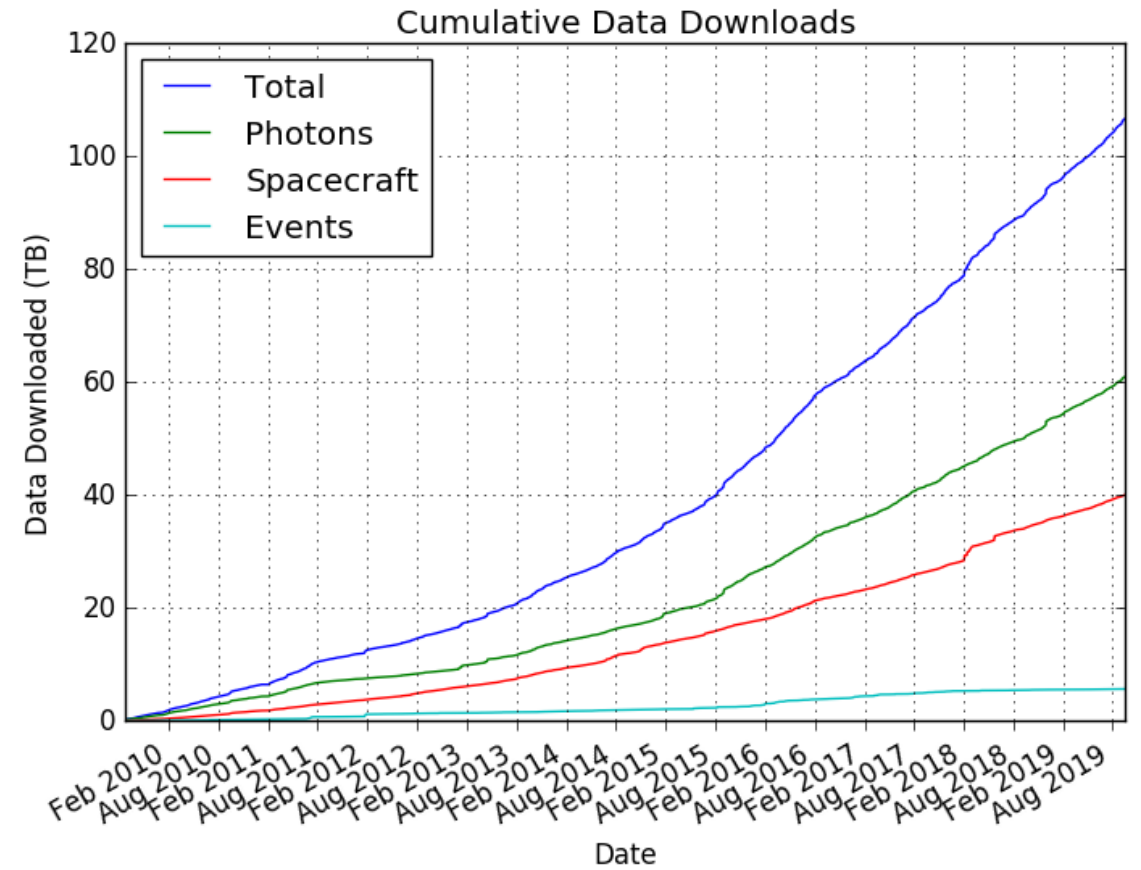
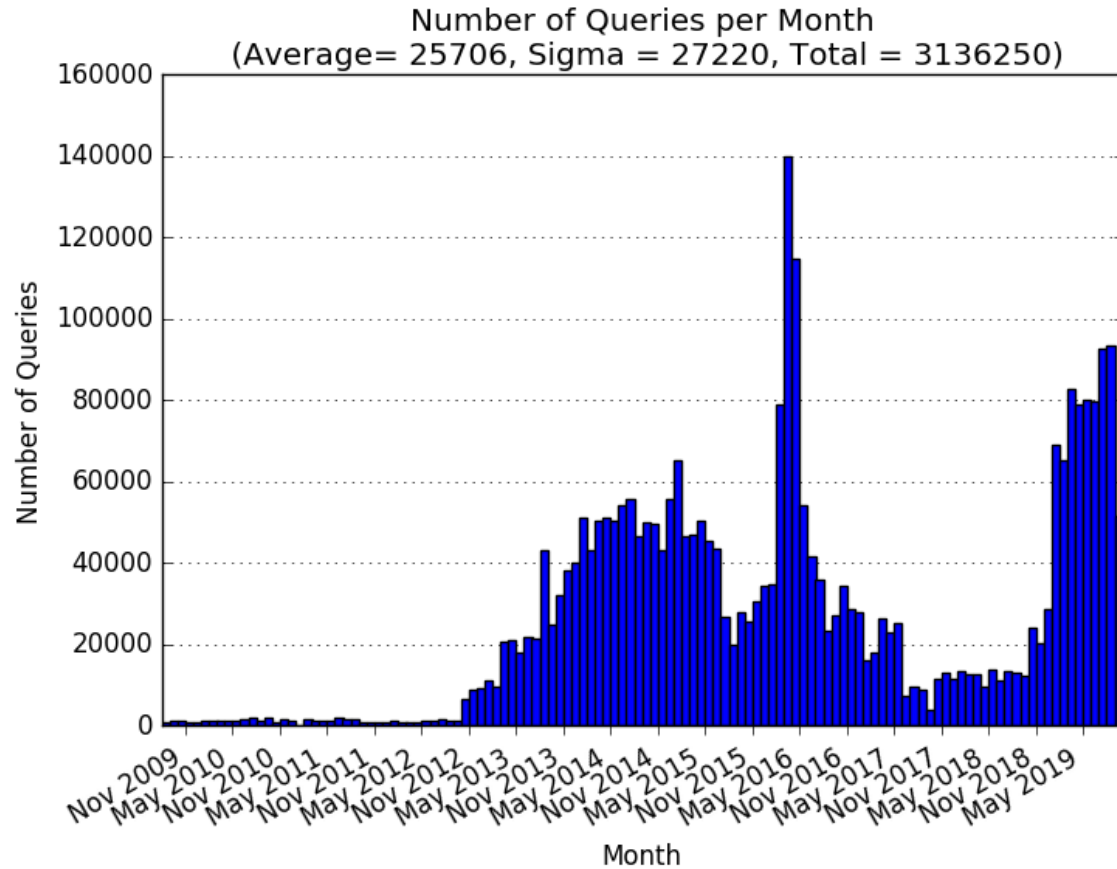
Fermi Users' Group Meeting, October 3, 2019

# FSSC Data Archive Status

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- **GBM Data**
  - Data ingest proceeding smoothly.
  - GBM archive is about 20TB in total (~2.5 TB/year currently).
  - Mostly continuous TTE files by volume
- **LAT**
  - Reprocessed Pass8 (P8R3) data public on 2018-11-26
  - LAT photon data ~114GB
  - LAT event data ~630GB
  - LAT spacecraft files ~1.5GB
- **Catalogs added to Browse**
  - 4FGL catalog added in February. Updated this week.
  - 2<sup>nd</sup> Fermi LAT GRB catalog added in July.

# FSSC LAT Data Server Statistics



# Spacecraft (FT2) File Reprocessing

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- Primary change is to add velocity information.
  - Requested by pulsar community.
- Improved calculation for geodetic latitude and altitude.
- Current status
  - Fixing old runs
  - Validating geo changes
  - Updated GLASTRelease for geo changes
- About 60k files to reprocess, deliver, and ingest at FSSC
- Timeframe
  - Several weeks to remake all the files
  - Need to be careful not to overload and interfere with production pipeline
  - At least a week to ingest at FSSC




# LAT Data Server Upgrade


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- **Current data server runs on old hardware**
  - Photon and spacecraft data are served from cluster of 10 nodes purchased in 2007.
  - Events and 1s spacecraft are handled by single machine from 2011.
  - Photon and event data are stored on disk in HTM FITS files.
- **Replacing with 5 new servers.**
  - Better CPU and more RAM.
  - Using NVME SSDs to increase I/O.
  - Limiting factor in data server speed is disk I/O.
- **Will greatly reduce query times.**
- **Will be able to add new capabilities.**
  - Need to determine what those will be.



- **Fermitools**
  - Moved to Conda for distribution. First release 2018-10-15.
  - Third party dependencies handled by Conda.
  - Reduces library compatibility issues.
  - Faster releases. Patch releases in March, April, May, June, and July.
  - Works in MS-Windows in Linux Subsystem for Windows
- Latest release is 1.0.10 in July. Next release is coming soon.
  - As of 9/30 there are 524 Linux downloads and 147 MacOS downloads from Conda
- Continuous integration (CI) model and open source tools
  - Code moved from CVS to Github.
  - Using Microsoft Azure cloud for build and test pipeline.
    - Allows builds on Linux and MacOS.
  - When a change is checked into Github, a build is automatically started, tests run, and binaries pushed to Conda cloud (if tests passed).





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**Fermi Gamma-Ray Space Telescope**


 Orbit
  <https://fermi.gsfc.nasa.gov>


 **Repositories** 158

 Packages








 People 25

 Teams 1

 Projects 2








Type: All
 Language: All
 

**Fermitools-conda**








 Shell
  BSD-3-Clause
  9
  13
  16
  0
 Updated yesterday
 

**modelEditor**

FSSC ScienceTools Model Editor GUI
 







 Python
  BSD-3-Clause
  0
  0
  0
  0
 Updated yesterday
 

**ScienceTools**






 Python
  BSD-3-Clause
  0
  0
  0
  2
 Updated 2 days ago
 

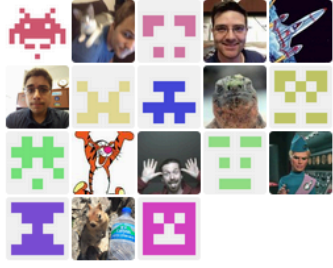
**fermitools-fhelp**

Repository for Fermitools fhelp files
 

 BSD-3-Clause
  0
  0
  0
  0
 Updated 2 days ago
 

**Top languages**

 C++
  Python
  Shell
  C
  Dockerfile

**People** 25 >
 



# Azure Pipeline Runs

**Azure DevOps**      FermiSpaceTelescope / Fermitools / Pipelines      Search      ?      Sign in

**Fermitools**

- Overview
- Boards
- Repos
- Pipelines**
- Pipelines
- Releases
- Artifacts

## Pipelines

Recent **Runs**

Description	Stages	
<b>Manually reset patch number</b> #20190926.6 on Fermitools - Full Build  master   fff6bd9	-  -  -	Yesterday 1h 4m 13s
<b>Update Env variable</b> #20190926.6 on modelEditor  master   db334f4	-  -  -  -	Yesterday 6m 30s
<b>Patch iteration triggered by pulsarDb repository.</b> #20190926.5 on Fermitools - Full Build  master   cf3b973	-  -  -	Yesterday 1h 6m 12s
<b>Update syntax</b> #20190926.5 on modelEditor  master   8c73322	-  -  -  -	Yesterday 6m 52s
<b>Patch iteration triggered by pulsarDb repository.</b> #20190926.4 on Fermitools - Full Build  master   cf3b973	-  -  -	Yesterday 1h 4m 12s
<b>Patch iteration triggered by pulsarDb repository.</b> #20190926.3 on Fermitools - Full Build  master   cf3b973	-  -  -	Yesterday 30m 15s



fermi / packages / fermitools



1

Conda

Files

Labels

Badges

Filters

Type: All ▾

Version: All ▾

Label: All ▾

<input type="checkbox"/>	Type	Size	Name	Uploaded	Uploader	Downloads	Labels
<input type="checkbox"/>	conda	90.0 MB	<a href="#">osx-64/fermitools-1.1.8-py27h39e3cac_0.tar.bz2</a>	1 day and 21 minutes ago	jasercion	4	dev
<input type="checkbox"/>	conda	151.2 MB	<a href="#">linux-64/fermitools-1.1.8-py27h39e3cac_0.tar.bz2</a>	1 day and 22 minutes ago	jasercion	1	dev
<input type="checkbox"/>	conda	90.0 MB	<a href="#">osx-64/fermitools-1.1.106-py27h39e3cac_1.tar.bz2</a>	1 day and 1 hour ago	jasercion	2	dev
<input type="checkbox"/>	conda	151.1 MB	<a href="#">linux-64/fermitools-1.1.106-py27h39e3cac_1.tar.bz2</a>	1 day and 1 hour ago	jasercion	1	dev
<input type="checkbox"/>	conda	90.0 MB	<a href="#">osx-64/fermitools-1.1.106-py27h39e3cac_0.tar.bz2</a>	1 day and 2 hours ago	jasercion	2	dev
<input type="checkbox"/>	conda	151.1 MB	<a href="#">linux-64/fermitools-1.1.106-py27h39e3cac_0.tar.bz2</a>	1 day and 2 hours ago	jasercion	1	dev
<input type="checkbox"/>	conda	163.7 MB	<a href="#">linux-64/fermitools-1.1.7-py27h39e3cac_0.tar.bz2</a>	2 months and 16 days ago	jasercion	19	dev
<input type="checkbox"/>	conda	89.6 MB	<a href="#">osx-64/fermitools-1.1.7-py27h39e3cac_0.tar.bz2</a>	2 months and 16 days ago	jasercion	9	dev
<input type="checkbox"/>	conda	163.7 MB	<a href="#">linux-64/fermitools-1.0.10-py27h39e3cac_0.tar.bz2</a>	2 months and 16 days ago	jasercion	514	main
<input type="checkbox"/>	conda	89.7 MB	<a href="#">osx-64/fermitools-1.0.10-py27h39e3cac_0.tar.bz2</a>	2 months and 16 days ago	jasercion	146	main


# Fermitools Roadmap

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- **Fermitools 1.2.0**
  - Add Eric Charles's changes to the energy dispersion method
  - Release set for early October 2019
- **Fermitools 1.4.0**
  - C++11 compatibility and ROOT 6 release
  - Will no longer need install flag to use old compilers need since January
  - Necessary before Python 3 release
  - Release planned for late October 2019
- **Fermitools 2.0**
  - Python 3 compatibility release
  - Python 2 is sunset in January 2020.
  - Packages have already stopped Python 2 updates.
  - No more updates to 1.X.X Fermitools versions.
  - Release planned for November 2019































- **Helpdesk**
  - ~4000 queries since the start of the mission.
  - ~18 queries per month over last year.
- **Github issue tracker**
  - **Public**
  - **Easier to track**
  - **Current 41 open issues and 45 closed.**
- **Attempt to increase collaboration and community involvement. Create how-tos and presentations for**
  - **How to use Github and fix bugs**
  - **User contributed software**
- **Intern converted analysis threads to Jupyter (Python) notebooks.**

# Github Tracker



Pull requests Issues Marketplace Explore
🔔 + 👤

Created Assigned Mentioned

 <b>41 Open</b>  <b>45 Closed</b>	Visibility ▾	Organization ▾	Sort ▾
 <b>fermi-lat/Fermitools-conda</b> <b>AttributeError: 'module' object has no attribute 'new_table'</b> #42 opened 24 days ago by Sanjuphysics12  updated 15 hours ago			 2
 <b>fermi-lat/Fermitools-conda</b> <b>Have tools put version in CREATOR keyword enhancement</b> #28 opened on Mar 7 by donhorner  updated 15 days ago			 4
 <b>fermi-lat/Fermitools-conda</b> <b>Python3 roadmap?</b> #44 opened 21 days ago by paulray  updated 16 days ago			 3
 <b>fermi-lat/Likelihood</b> <b>gtsrcmap: Problem on the creation of the source maps with the new spectral functions in the 4FGL</b> #46 opened 22 days ago by principe91  updated 18 days ago			 5
 <b>fermi-lat/Fermitools-conda</b> <b>fermitools behaviour sensitive to the linux version</b> #43 opened 22 days ago by landriu  updated 22 days ago			 2
 <b>fermi-lat/Fermitools-conda</b> <b>Caught St13runtime_error at the top level: RoiCuts::sortCuts:</b> #40 opened 27 days ago by Sanjuphysics12  updated 24 days ago			 3
 <b>fermi-lat/Fermitools-conda</b> <b>gtltcube execution failed during light curve generation</b> #39 opened on Aug 27 by Sanjuphysics12  updated 29 days ago			 3

# Other Activities

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- **FSSC helps maintain L1 pipeline and other infrastructure/services at SLAC.**
  - **Attempting to capture knowledge, e.g., for reprocessing.**
- **Created documentation for how to run the Azure pipelines, Conda, etc.**
- **Supporting Docker container**
  - **Produced for summer school. Now for general use.**
  - **Contains other utilities like HEASoft, fermipy, tempo2, etc.**
- **Adding user contributed tools to website.**
- **Cleaning up documentation on website and fhelp files.**