Database Access and the dataSubselector Tool

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DC1 Kickoff Workshop

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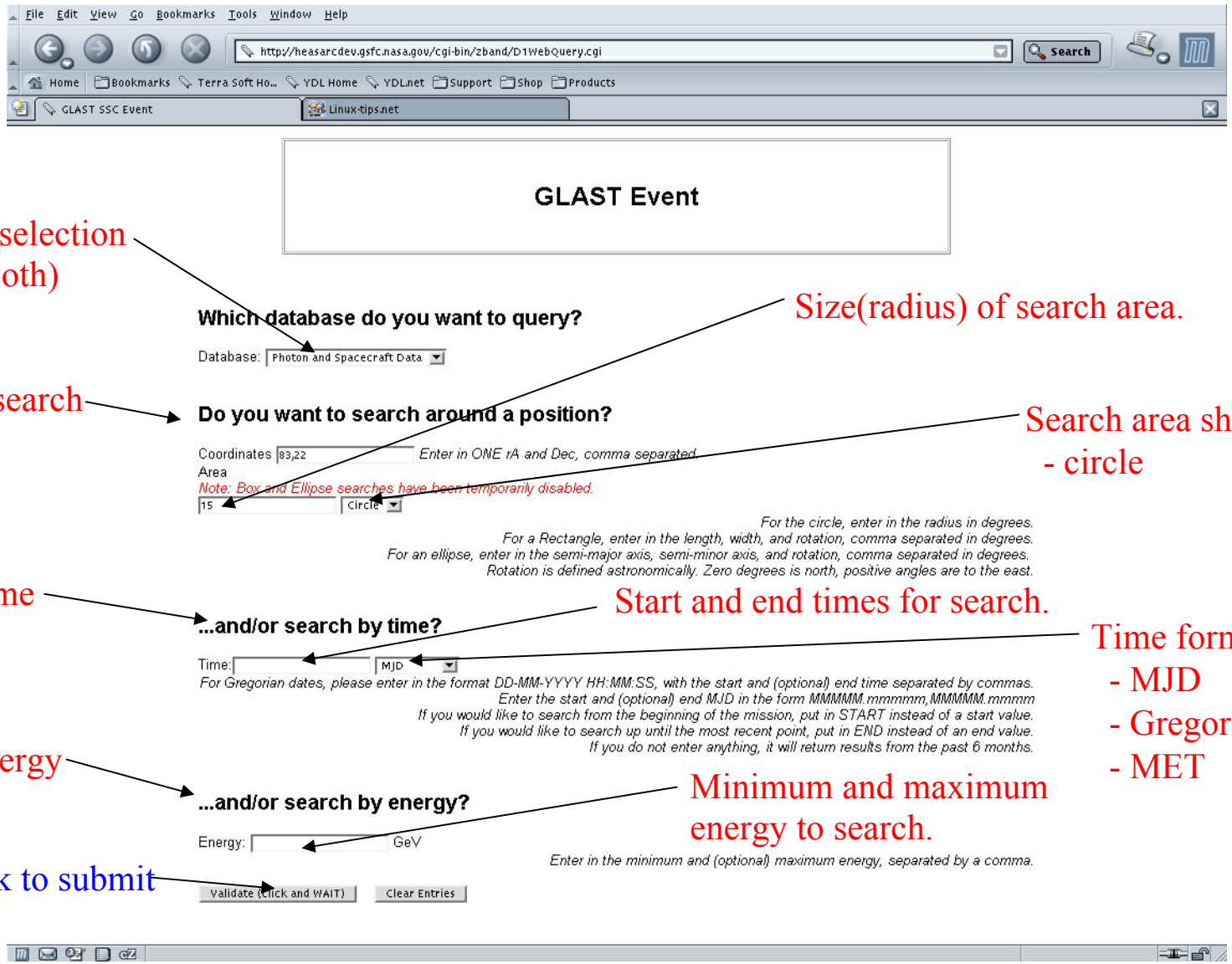
D1/D2 Database Interface

- ***Access to the LAT Event Summary (D1) and the Pointing, Livetime and Mode History (D2) databases is provided by the GLAST SSC's website at http://glast.gsfc.nasa.gov/cgi-bin/ssc/U1/D1WebDC1.cgi***

- ***This site allows access to both databases either individually or simultaneously.***

DC1 Web interface



Database selection (D1/D2/Both)

Size(radius) of search area.

Position search

Search area shape:
- circle

and/or Time search

Start and end times for search.

Time format:
- MJD
- Gregorian
- MET

and/or Energy search

Minimum and maximum energy to search.

Click to submit

Search Options

- ***Database Options***
  - *D1 – LAT Event Summary Database (for DC1 this is just photons)*
  - *D2 – Pointing, Livetime and Mode History Database*
  - *Both together – This is the default behavior*

- ***Position Search Options***
  - *Search coordinates – entered as a comma separated RA,Dec pair*
    - *Currently must be in decimal degrees.*
    - *Sexagesimal input coming soon*
  - *Search areas – currently only allows searches on circular regions*
    - *Enter radius of circle in degrees*

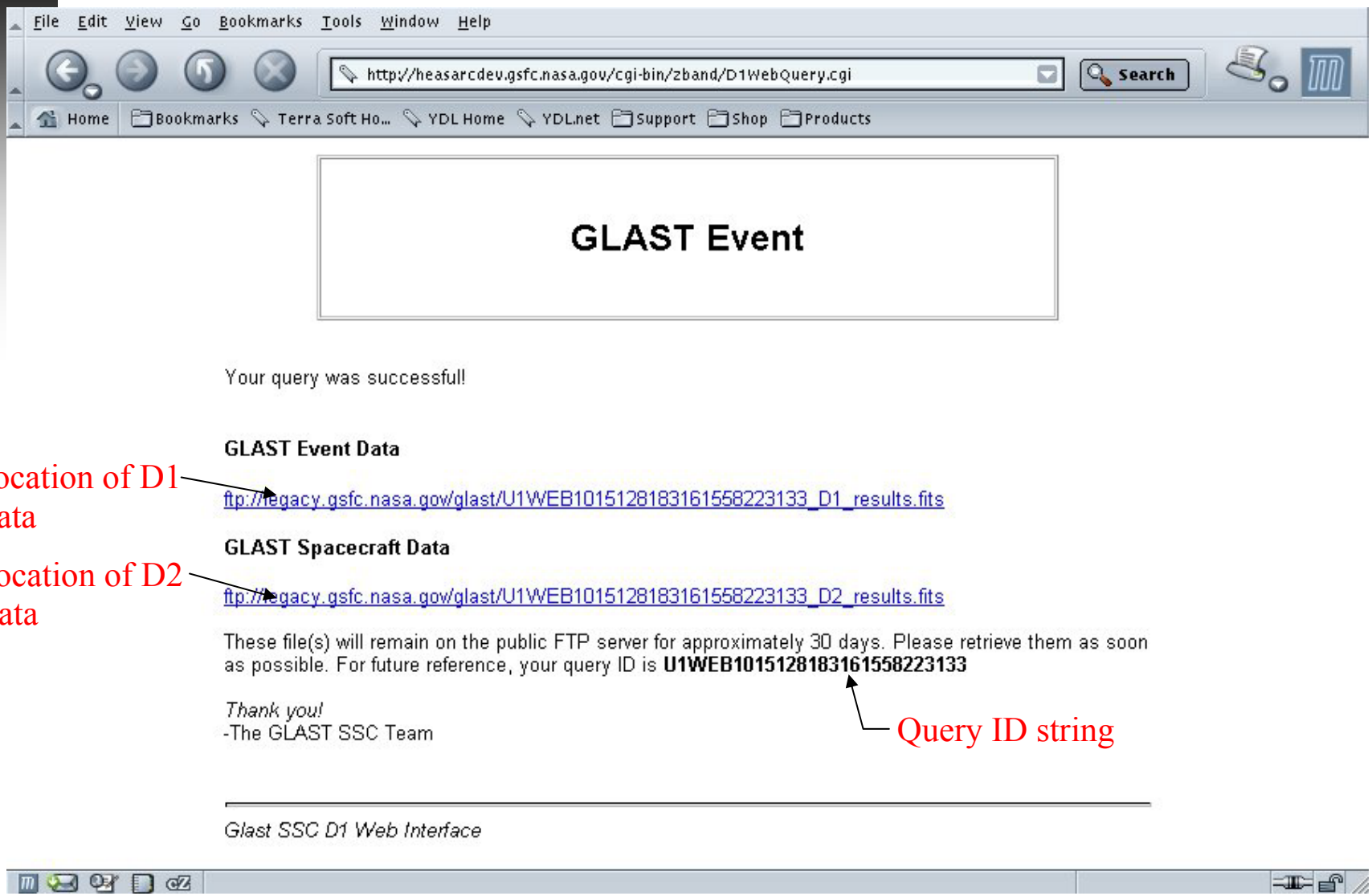
Search Options (cont.)

- ***Time Search Options***
  - *Time can be entered in multiple formats*
    - *MJD*
    - *Gregorian Date/Time*
    - *Mission Elapsed Time (MET) in seconds*
  - *Times entered as a comma separated start and end time*
  - *End time is optional. If omitted, the search returns 6 months of data beginning with the start time entered.*
  - *If no time cut is specified, the past six months of data is returned.*
  - *Optional START and END keywords can be used to respectively specify the beginning of the data and the most recent data in the system.*

Search Options (cont.)

- ***Energy Search Options***
  - *Units are MeV – natural units of the FT1 file*
  - *Energies are entered as a comma separated low, high energy limit pair*
  - *The high energy limit is optional. If omitted the search returns all data with energy greater than the lower limit.*
  - *If no energy cuts entered all the data is returned.*
  - *For searches with just an upper energy limit use 0 as the lower limit.*

Results Page



Location of D1 Data

Location of D2 Data

Query ID string

Results Description

- ***Data location***
  - *The URL for the requested data is presented on the query results page*
    - *One link(file) for data from each database*
    - *Click to download*
- ***Query ID***
  - *The query ID is used to identify the files generated by the query and is stored in the database log files*
- ***Data lifetime on FTP server***
  - *We only have a small amount of disk space so get your data immediately. It will only be there for a few days.*

dataSubselector Tool

- ***Called the User-level Data Extraction Tool (U2) in the Science tools description.***
- ***Allows the user to make additional cuts on more parameters than the web interface to D1***
  - *Position (RA,Dec and radius)*
  - *Time (MET)*
  - *Energy (MeV)*
  - *Instrument Coordinates (THETA and PHI)*
  - *Zenith Angle*
  - *Reconstruction data cuts (background, PSF and energy resolution)*
  - *IMGAMMAPROB data column*
- ***For DC1 dataSubselector is a very basic command line tool***

dataSubselector Usage

```
U2 <input file> <output file> [options]  to process a file
     or
U2 -h to print the help text

options:

  -ra <value> - RA for new search center
  -dec <value> - Dec for new search center
  -rad <value> - radius of new search region
  -tmin <value> - start time
  -tmax <value> - end time
  -emin <value> - lower energy limit
  -emax <value> - upper energy limit
  -thetamin <value> - minimum theta value
  -thetamax <value> - maximum theta value
  -phimin <value> - minimum phi value
  -phimax <value> - maximum phi value
  -gammaProbMin <value> - minimum probablilty that event is a gamma ray
  -gammaProbMax <value> - maximum probablilty that event is a gamma ray
  -zmin <value> - minimum zenith angle value
  -zmax <value> - maximum zenith angle value
  -bgcut - select only events that passed background cut
  -psfcut - select only events that passed PSF cut
  -erescut - select only events that passed energy resolution cut

If no options are specified, the file will simply be copied
from <input file> to <output file>.
```

dataSubselector Usage Examples

- ***Select only events with energy between 1 and 10 GeV with a Zenith angle of less than 30°:***

```
dataSubselector input.fits output.fits –emin 1000
–emax 10000 –zmax 30
```

- ***Select only events that passed all three reconstruction cuts (background, PSF and energy resolution):***

```
dataSubselector input.fits output.fits –bgcut
–psfcut -erescut
```