

**Likelihood Update**  
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## Changes — Likelihood v11r5 through v11r7p2

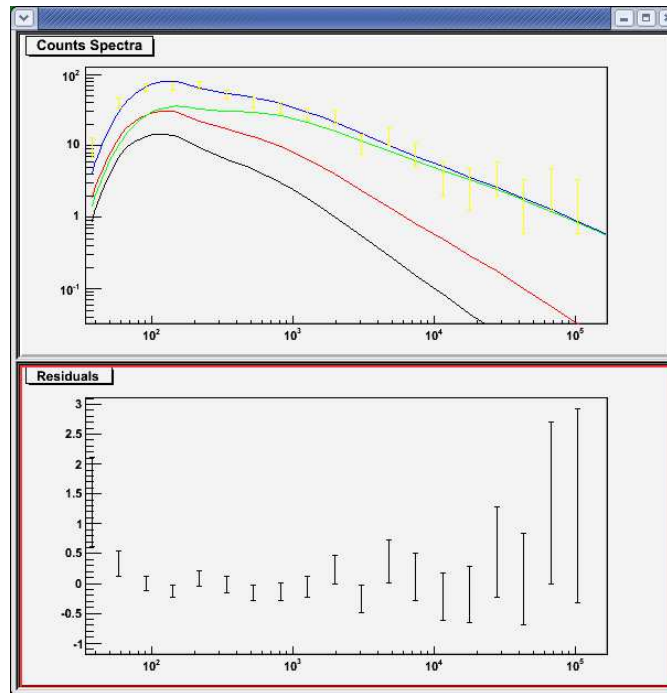
- Re-integrate counts spectrum plotting feature in `gtlikelihood` (v11r5)
- Start debugging pixel-offset problem in convolved diffuse maps (v11r5p1)
- Improve interpolation scheme in FileFunction model; fix derivative bug (v11r5p[23])
- Fix `PointSource::Npred(emin, emax)` bug (v11r5p4)
- **Re-enable counts spectrum plotting using new support in `st_graph` for log scale plots** (v11r6)
- Add `CountsSpectra` class for use by plotting and “badness” of fit warning; **write out FITS file of observed and model counts and model fluxes** (v11r6)
- One more convolved diffuse map bug-fix (v11r6p2)
- **Added `gtfindsrc` application** (v11r7)

## pyLikelihood v0r2p2 through v0r3p2

- Internal refactoring: use optimizers::OptimizerFactory interface (v0r2p2)
- **Read glikelihood.par for starting an binned or unbinned analysis (v0r3)**
- Windows build bug-fixes (v0r3p1)
- Catch ImportError if Tkinter is not available (v0r3p2)

## Details

- Plotting feature in gtl likelihood:  
\$ gtl likelihood plot=yes



- FITS file (counts\_spectra.fits) containing observed and model counts and model fluxes (replaces counts.dat):

```
salathe[jchiang] fitsinfo counts_spectra.fits
```

```
Filename: counts_spectra.fits
```

No.	Name	Type	Cards	Dimensions	Format
0	PRIMARY	PrimaryHDU	9	()	Float32
1	COUNTS_SPECTRA	BinTableHDU	19	20R x 4C	[1D, 1D, 1D, 1D]
2	FLUXES	BinTableHDU	17	20R x 3C	[1D, 1D, 1D]
3	EBOUNDS	BinTableHDU	15	20R x 2C	[1D, 1D]

```
salathe[jchiang] flcol "counts_spectra.fits[1]"
```

```
___Column_Names_____Formats_____Dims_____Units___
```

```
ObsCounts                1D
```

```
my_3EG_J0530p1323        1D
```

```
my_3EG_J0534p2200        1D
```

```
my_3EG_J0633p1751        1D
```

```
salathe[jchiang] flcol "counts_spectra.fits[2]"
```

```
___Column_Names_____Formats_____Dims_____Units___
```

```
my_3EG_J0530p1323        1D
```

```
my_3EG_J0534p2200        1D
```

```
my_3EG_J0633p1751        1D
```

```
salathe[jchiang]
```

```
• salatthe[jchiang] gtfindsrc
Event file [] : filtered.fits
Spacecraft file [] : test_scData_0000.fits
Output file for trial points [] : trial_points.txt
Livetime cube file [none] : expCube.fits
Unbinned exposure map [none] :
Source model file [none] : anticenter_model.xml
Building source model from anticenter_model.xml
Target source name [] : my_3EG_J0534p2200
Optimizer <LBFGS|MINUIT|DRMNGB> [MINUIT] :
Fit tolerance [1e-8] :
Positional fit tolerance [1e-05] :
83.57  22.01  4766.39
91.927 22.01  5420.87
83.57  24.211 5037.1
75.213 24.211 5424.92
<...snip...>
83.5868 22.0204 4766.48
83.5564 22.0329 4766.29
Best fit position: 83.5564, 22.0329
Error circle radius: 0.038667
salatthe[jchiang]
```

- Reading gtlikelihood.par file from pyLikelihood

```
salathe[jchiang] python
Python 2.4.1 (#1, Apr 16 2005, 20:21:47)
[GCC 3.3.2 20031022 (Red Hat Linux 3.3.2-1)] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> from UnbinnedAnalysis import *
>>> like = unbinnedAnalysis(rspfunc='DC1A')
Spacecraft file [test_scData_0000.fits] :
Event file [filtered.fits] :
Unbinned exposure map [none] :
Exposure hypercube file [expCube.fits] :
Source model file [anticenter_model.xml] :
Optimizer <LBFGS|MINUIT|DRMNGB> [DRMNGB] :
>>>
>>> like2 = unbinnedAnalysis(rspfunc='DC1A', mode='h')
>>> like2.model
my_3EG_J0530p1323
  Spectrum: PowerLaw2
0      Integral:  8.723e+00  0.000e+00  1.000e-05  1.000e+03 ( 1.000e-06)
1          Index: -2.418e+00  0.000e+00 -5.000e+00  0.000e+00 ( 1.000e+00)
2      LowerLimit:  2.000e+01  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed
3      UpperLimit:  2.000e+05  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed
```

my\_3EG\_J0534p2200

Spectrum: PowerLaw2

4	Integral:	1.715e+01	0.000e+00	1.000e-05	1.000e+03	( 1.000e-06)	
5	Index:	-2.274e+00	0.000e+00	-5.000e+00	0.000e+00	( 1.000e+00)	
6	LowerLimit:	2.000e+01	0.000e+00	2.000e+01	2.000e+05	( 1.000e+00)	fixed
7	UpperLimit:	2.000e+05	0.000e+00	2.000e+01	2.000e+05	( 1.000e+00)	fixed

my\_3EG\_J0633p1751

Spectrum: PowerLaw2

8	Integral:	1.349e+01	0.000e+00	1.000e-05	1.000e+03	( 1.000e-06)	
9	Index:	-1.771e+00	0.000e+00	-5.000e+00	0.000e+00	( 1.000e+00)	
10	LowerLimit:	2.000e+01	0.000e+00	2.000e+01	2.000e+05	( 1.000e+00)	fixed
11	UpperLimit:	2.000e+05	0.000e+00	2.000e+01	2.000e+05	( 1.000e+00)	fixed

>>>