

{{lastupdated_at}} by {{lastupdated_by}}

Validation of Pass 7 IRFs

GammaLib-00-06-00

The initial validation of the Pass 7 IRFs has been done using GammaLib-00-06-00. Here the results for several datasets.

week_00000_roi05_200_20000_10bin_extmod_galpropv02_Crab_Itcube

Parameter	gtlike	gammalib (with correction)	gammalib (w/o correction)
Counts (for same flux)	814.987	842.551	827.99
Flux	24.23 +/- 1.50	19.23 +/- 1.21	-
Spectral index	2.125 +/- 0.048	2.039 +/- 0.051	-
Extragalactic diffuse	2.286 +/- 0.462	2.896 +/- 0.442	-
Galactic diffuse	0.862 +/- 0.065	0.863 +/- 0.064	-

gtlike results

Crab:
Integral: 24.2369 +/- 1.49572
Index: -2.12467 +/- 0.0476363
LowerLimit: 100
UpperLimit: 500000
TS value: 1300.37
Flux: 2.41076e-06 +/- 1.50551e-07 photons/cm^2/s
Total number of model events: 814.987

Extragal_diffuse:
Normalization: 2.28565 +/- 0.462091
Flux: 0.000472695 +/- 9.55313e-05 photons/cm^2/s

Galactic_diffuse:
Value: 0.861504 +/- 0.0652024
Flux: 0.00041505 +/- 3.14108e-05 photons/cm^2/s

WARNING: Fit may be bad in range [100, 1258.93] (MeV)
WARNING: Fit may be bad in range [1995.26, 5011.87] (MeV)

Total number of observed counts: 2211
Total number of model events: 2211

-log(Likelihood): 10794.50987

GammaLib Results with efficiency correction

=== GOptimizerLM ===
Optimized function value ...: 10814.4
Absolute precision: 1e-06
Optimization status: converged
Number of parameters: 13
Number of free parameters ..: 4
Number of iterations: 9
Lambda: 1e-12
=== GObservations ===
Number of observations ..::: 1

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Number of predicted events : 2211
=== GModels ===
Number of models .....: 3
Number of parameters .....: 13
=== GModelDiffuseSource ===
Name .....: Extragal_diffuse
Instruments .....: all
Model type .....: "ConstantValue" * "FileFunction" * "Constant"
Number of parameters .....: 3
Number of spatial par's ...: 1
Value .....: 1 [0,10] (fixed,scale=1,gradient)
Number of spectral par's ...: 1
Normalization .....: 2.89602 +/- 0.441842 [0,1000] (free,scale=1,gradient)
Number of temporal par's ...: 1
Constant .....: 1 (relative value) (fixed,scale=1,gradient)
=== GModelDiffuseSource ===
Name .....: Galactic_diffuse
Instruments .....: all
Model type .....: "MapCubeFunction" * "ConstantValue" * "Constant"
Number of parameters .....: 3
Number of spatial par's ...: 1
Normalization .....: 1 [0.001,1000] (fixed,scale=1,gradient)
Number of spectral par's ...: 1
Value .....: 0.862952 +/- 0.0637931 [0,1000] (free,scale=1,gradient)
Number of temporal par's ...: 1
Constant .....: 1 (relative value) (fixed,scale=1,gradient)
=== GModelPointSource ===
Name .....: Crab
Instruments .....: all
Model type .....: "SkyDirFunction" * "PowerLaw2" * "Constant"
Number of parameters .....: 7
Number of spatial par's ...: 2
RA .....: 83.6331 [-360,360] deg (fixed,scale=1)
DEC .....: 22.0145 [-90,90] deg (fixed,scale=1)
Number of spectral par's ...: 4
Integral .....: 1.92253e-06 +/- 1.20962e-07 [1e-14,0.0001] ph/cm2/s (free,scale=1e-07,gradient)
Index .....: -2.03863 +/- 0.0509223 [-5,5] (free,scale=1,gradient)
LowerLimit .....: 100 [10,1e+06] MeV (fixed,scale=1)
UpperLimit .....: 500000 [10,1e+06] MeV (fixed,scale=1)
Number of temporal par's ...: 1
Constant .....: 1 (relative value) (fixed,scale=1,gradient)

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week_00000_P7_roi05_100_200_01bin_extmod_galprop_crab

Analysis performed with fixed spectral index over a narrow energy range of 100-200 MeV.

Parameter	gtlike	gammalib (with correction)
-logL	2395.656	2396.97
Predicted counts	658.017	658
Flux	26.10 +/- 3.10	15.58 +/- 1.95
Spectral index	-2.1	-2.1
Extragalactic diffuse	3.47 +/- 1.35	3.95 +/- 1.29
Galactic diffuse	0.68 +/- 0.36	0.71 +/- 0.40

gtlike results

Crab:
Integral: 26.1036 +/- 3.10488
Index: -2.1
LowerLimit: 100
UpperLimit: 500000
TS value: 108.858
Flux: 1.39271e-06 +/- 1.65655e-07 photons/cm^2/s

Extragal_diffuse:
Normalization: 3.47027 +/- 1.34533
Flux: 0.000427812 +/- 0.000165849 photons/cm^2/s

Galactic_diffuse:
Value: 0.679862 +/- 0.362457
Flux: 0.000134393 +/- 7.16491e-05 photons/cm^2/s

WARNING: Fit may be bad in range [100, 200] (MeV)

Total number of observed counts: 658
Total number of model events: 658.017

-log(Likelihood): 2395.656269

GammaLib Results with efficiency correction

2012-07-11T21:55:18: === GOptimizerLM ===
2012-07-11T21:55:18: Optimized function value ...: 2396.97
2012-07-11T21:55:18: Absolute precision: 1e-06
2012-07-11T21:55:18: Optimization status: converged
2012-07-11T21:55:18: Number of parameters: 13
2012-07-11T21:55:18: Number of free parameters ..: 3
2012-07-11T21:55:18: Number of iterations: 6
2012-07-11T21:55:18: Lambda: 1e-09
2012-07-11T21:55:18: Maximum log likelihood: -2396.97
2012-07-11T21:55:18: Npred: 658
2012-07-11T21:55:18: === GModels ===
2012-07-11T21:55:18: Number of models: 3
2012-07-11T21:55:18: Number of parameters: 13
2012-07-11T21:55:18: === GModelDiffuseSource ===
2012-07-11T21:55:18: Name: Extragal_diffuse
2012-07-11T21:55:18: Instruments: all
2012-07-11T21:55:18: Model type: "ConstantValue" * "FileFunction" * "Constant"
2012-07-11T21:55:18: Number of parameters: 3
2012-07-11T21:55:18: Number of spatial par's ...: 1
2012-07-11T21:55:18: Value: 1 [0,10] (fixed,scale=1,gradient)
2012-07-11T21:55:18: Number of spectral par's ...: 1
2012-07-11T21:55:18: Normalization: 3.95168 +/- 1.29363 [0,1000] (free,scale=1,gradient)
2012-07-11T21:55:18: Number of temporal par's ...: 1
2012-07-11T21:55:18: Constant: 1 (relative value) (fixed,scale=1,gradient)
2012-07-11T21:55:18: === GModelDiffuseSource ===
2012-07-11T21:55:18: Name: Galactic_diffuse
2012-07-11T21:55:18: Instruments: all
2012-07-11T21:55:18: Model type: "MapCubeFunction" * "ConstantValue" * "Constant"
2012-07-11T21:55:18: Number of parameters: 3
2012-07-11T21:55:18: Number of spatial par's ...: 1
2012-07-11T21:55:18: Normalization: 1 [0.001,1000] (fixed,scale=1,gradient)
2012-07-11T21:55:18: Number of spectral par's ...: 1
2012-07-11T21:55:18: Value: 0.71251 +/- 0.398651 [0,1000] (free,scale=1,gradient)
2012-07-11T21:55:18: Number of temporal par's ...: 1
2012-07-11T21:55:18: Constant: 1 (relative value) (fixed,scale=1,gradient)
2012-07-11T21:55:18: === GModelPointSource ===
2012-07-11T21:55:18: Name: Crab
2012-07-11T21:55:18: Instruments: all
2012-07-11T21:55:18: Model type: "SkyDirFunction" * "PowerLaw2" * "Constant"

2012-07-11T21:55:18: Number of parameters: 7
 2012-07-11T21:55:18: Number of spatial par's ...: 2
 2012-07-11T21:55:18: RA: 83.6331 [-360,360] deg (fixed,scale=1)
 2012-07-11T21:55:18: DEC: 22.0145 [-90,90] deg (fixed,scale=1)
 2012-07-11T21:55:18: Number of spectral par's ...: 4
 2012-07-11T21:55:18: Integral: 1.55815e-06 +/- 1.94647e-07 [1e-14,0.0001] ph/cm2/s (free,scale=1e-07,gradient)
 2012-07-11T21:55:18: Index: -2.1 [-5,5] (fixed,scale=1,gradient)
 2012-07-11T21:55:18: LowerLimit: 100 [10,1e+06] MeV (fixed,scale=1)
 2012-07-11T21:55:18: UpperLimit: 500000 [10,1e+06] MeV (fixed,scale=1)
 2012-07-11T21:55:18: Number of temporal par's ...: 1
 2012-07-11T21:55:18: Constant: 1 (relative value) (fixed,scale=1,gradient)

week_00000_P7_roi05_1000_2000_01bin_extmod_galprop_crab

Analysis performed with fixed spectral index over a narrow energy range from 1-2 GeV.

Parameter	gtlike	gammalib (with correction)
-logL	874.856	879.393
Predicted counts	213.042	213
Flux	27.72 +/- 3.30	25.58 +/- 3.21
Spectral index	-2.1	-2.1
Extragalactic diffuse	0.00019418 +/- 0.0433937	0 +/- 5.5129
Galactic diffuse	0.95 +/- 0.09	0.85 +/- 0.25

gtlike results

Crab:
 Integral: 27.7185 +/- 3.29829
 Index: -2.1
 LowerLimit: 100
 UpperLimit: 500000
 TS value: 335.184
 Flux: 1.17471e-07 +/- 1.39781e-08 photons/cm^2/s

Extragal_diffuse:
 Normalization: 0.00019418 +/- 0.0433937
 Flux: 7.9062e-10 +/- 1.7668e-07 photons/cm^2/s

Galactic_diffuse:
 Value: 0.952101 +/- 0.092758
 Flux: 2.87516e-05 +/- 2.8011e-06 photons/cm^2/s

WARNING: Fit may be bad in range [1000, 2000] (MeV)

Total number of observed counts: 213
 Total number of model events: 213.042

-log(Likelihood): 874.8585611

GammaLib Results with efficiency correction

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2012-07-11T22:11:46: === GOptimizerLM ===
2012-07-11T22:11:46: Optimized function value ...: 879.393
2012-07-11T22:11:46: Absolute precision .....: 1e-06
2012-07-11T22:11:46: Optimization status .....: converged
2012-07-11T22:11:46: Number of parameters .....: 13
2012-07-11T22:11:46: Number of free parameters ..: 3
2012-07-11T22:11:46: Number of iterations .....: 23
2012-07-11T22:11:46: Lambda .....: 1
2012-07-11T22:11:46: Maximum log likelihood .....: -879.393
2012-07-11T22:11:46: Npred .....: 213
2012-07-11T22:11:46: === GModels ===
2012-07-11T22:11:46: Number of models .....: 3
2012-07-11T22:11:46: Number of parameters .....: 13
2012-07-11T22:11:46: === GModelDiffuseSource ===
2012-07-11T22:11:46: Name .....: Extragal_diffuse
2012-07-11T22:11:46: Instruments .....: all
2012-07-11T22:11:46: Model type .....: "ConstantValue" * "FileFunction" * "Constant"
2012-07-11T22:11:46: Number of parameters .....: 3
2012-07-11T22:11:46: Number of spatial par's ...: 1
2012-07-11T22:11:46: Value .....: 1 [0,10] (fixed,scale=1,gradient)
2012-07-11T22:11:46: Number of spectral par's ...: 1
2012-07-11T22:11:46: Normalization .....: 0 +/- 5.5129 [0,1000] (free,scale=1,gradient)
2012-07-11T22:11:46: Number of temporal par's ...: 1
2012-07-11T22:11:46: Constant .....: 1 (relative value) (fixed,scale=1,gradient)
2012-07-11T22:11:46: === GModelDiffuseSource ===
2012-07-11T22:11:46: Name .....: Galactic_diffuse
2012-07-11T22:11:46: Instruments .....: all
2012-07-11T22:11:46: Model type .....: "MapCubeFunction" * "ConstantValue" * "Constant"
2012-07-11T22:11:46: Number of parameters .....: 3
2012-07-11T22:11:46: Number of spatial par's ...: 1
2012-07-11T22:11:46: Normalization .....: 1 [0.001,1000] (fixed,scale=1,gradient)
2012-07-11T22:11:46: Number of spectral par's ...: 1
2012-07-11T22:11:46: Value .....: 0.84716 +/- 0.248145 [0,1000] (free,scale=1,gradient)
2012-07-11T22:11:46: Number of temporal par's ...: 1
2012-07-11T22:11:46: Constant .....: 1 (relative value) (fixed,scale=1,gradient)
2012-07-11T22:11:46: === GModelPointSource ===
2012-07-11T22:11:46: Name .....: Crab
2012-07-11T22:11:46: Instruments .....: all
2012-07-11T22:11:46: Model type .....: "SkyDirFunction" * "PowerLaw2" * "Constant"
2012-07-11T22:11:46: Number of parameters .....: 7
2012-07-11T22:11:46: Number of spatial par's ...: 2
2012-07-11T22:11:46: RA .....: 83.6331 [-360,360] deg (fixed,scale=1)
2012-07-11T22:11:46: DEC .....: 22.0145 [-90,90] deg (fixed,scale=1)
2012-07-11T22:11:46: Number of spectral par's ...: 4
2012-07-11T22:11:46: Integral .....: 2.55776e-06 +/- 3.20673e-07 [1e-14,0.0001] ph/cm2/s (free,scale=1e-07,gradient)
2012-07-11T22:11:46: Index .....: -2.1 [-5,5] (fixed,scale=1,gradient)
2012-07-11T22:11:46: LowerLimit .....: 100 [10,1e+06] MeV (fixed,scale=1)
2012-07-11T22:11:46: UpperLimit .....: 500000 [10,1e+06] MeV (fixed,scale=1)
2012-07-11T22:11:46: Number of temporal par's ...: 1
2012-07-11T22:11:46: Constant .....: 1 (relative value) (fixed,scale=1,gradient)

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