<table>
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<tr>
<th>Publication Year</th>
<th>2015</th>
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<tr>
<td>Acceptance in OA@INAF</td>
<td>2020-05-15T13:42:49Z</td>
</tr>
<tr>
<td>Title</td>
<td>VizieR Online Data Catalog: Fermi LAT third source catalog (3FGL) (Acero+, 2015)</td>
</tr>
<tr>
<td>Authors</td>
<td>Acero, F.; Ackermann, M.; Ajello, M.; Albert, A.; Atwood, W. B.; et al.</td>
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<tr>
<td>Handle</td>
<td><a href="http://hdl.handle.net/20.500.12386/24875">http://hdl.handle.net/20.500.12386/24875</a></td>
</tr>
<tr>
<td>Journal</td>
<td>VizieR Online Data Catalog</td>
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</table>
Fermi Large Area Telescope third source catalog.


ADC_Keywords: Active gal. nuclei ; Gamma rays ; Pulsars ; BL Lac objects ; Surveys

Mission_Name: Fermi

Keywords: catalogs; gamma rays: general

Abstract:

We present the third Fermi Large Area Telescope (LAT) source catalog (3FGL) of sources in the 100MeV-300GeV range. Based on the first 4yr of science data from the Fermi Gamma-ray Space Telescope mission, it is the deepest yet in this energy range. Relative to the Second Fermi LAT catalog, the 3FGL catalog incorporates twice as much data, as well as a number of analysis improvements, including improved calibrations at the event reconstruction level, an updated model for Galactic diffuse γ-ray emission, a refined procedure for source detection, and improved methods for associating LAT sources with potential counterparts at other wavelengths. The 3FGL catalog includes 3033 sources above 4σ significance, with source location regions, spectral properties, and monthly light curves for each. Of these, 78 are flagged as potentially being due to imperfections in the model for Galactic diffuse emission. Twenty-five sources are modeled explicitly as spatially extended, and overall 238 sources are considered as identified based on angular extent or correlated variability (periodic or otherwise) observed at other wavelengths. For 1010 sources we have not found plausible counterparts at other wavelengths. More than 1100 of the identified or associated sources are active galaxies of the blazar class; several other classes of non-blazar active galaxies are also represented in the 3FGL. Pulsars represent the largest Galactic source class. From source counts of Galactic sources we estimate that the contribution of unresolved sources to the Galactic diffuse emission is ∼3% at 1GeV.

Description:

The data for the 3FGL catalog were taken during the period from 2008 August 4 (15:43 UTC) to 2012 July 31 (22:46 UTC), covering close to 4yr. The LAT detects γ-rays in the energy range from 20MeV to more than 300GeV.

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<td>4984</td>
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**Bytes Format Units Label Explanations**

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<td>A13</td>
<td>---</td>
<td>3FGL</td>
<td>The 3FGL name (1)</td>
</tr>
<tr>
<td>15-21</td>
<td>F.7.3</td>
<td>deg</td>
<td>RAdeg</td>
<td>Right Ascension in decimal degrees (J2000)</td>
</tr>
<tr>
<td>23-29</td>
<td>F.7.3</td>
<td>deg</td>
<td>DEdeg</td>
<td>Declination in decimal degrees (J2000)</td>
</tr>
<tr>
<td>31-37</td>
<td>F.7.3</td>
<td>deg</td>
<td>GLON</td>
<td>Galactic longitude</td>
</tr>
<tr>
<td>39-45</td>
<td>F.7.3</td>
<td>deg</td>
<td>GLAT</td>
<td>Galactic latitude</td>
</tr>
<tr>
<td>47-51</td>
<td>F.5.3</td>
<td>deg</td>
<td>amaj</td>
<td>[0.005/1.1]? 95% confidence error ellipse semi-major axis</td>
</tr>
<tr>
<td>53-57</td>
<td>F.5.3</td>
<td>deg</td>
<td>amin</td>
<td>[0.005/6.6]? 95% confidence error ellipse semi-minor axis</td>
</tr>
<tr>
<td>59-61</td>
<td>I3</td>
<td>deg</td>
<td>phi</td>
<td>[-90/90]? Position angle φ of error ellipse (East of North)</td>
</tr>
<tr>
<td>63-68</td>
<td>F.6.1</td>
<td>---</td>
<td>Sig</td>
<td>[4/10^9]? Significance (2)</td>
</tr>
<tr>
<td>70-75</td>
<td>F.6.1</td>
<td>10^-5/m2/s</td>
<td>F35</td>
<td>Photon flux summed over 3 bands</td>
</tr>
<tr>
<td>77-79</td>
<td>F.3.1</td>
<td>10^-5/m2/s</td>
<td>e_F35</td>
<td></td>
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<tr>
<td>81-86</td>
<td>F.6.1</td>
<td>10^-5/m2</td>
<td>S25</td>
<td></td>
</tr>
<tr>
<td>88-91</td>
<td>F.4.1</td>
<td>10^-5/m2</td>
<td>e_S25</td>
<td>[0.4/26]? The 1σ uncertainty in S25</td>
</tr>
<tr>
<td>93-96</td>
<td>F.4.2</td>
<td>---</td>
<td>Gamma</td>
<td>[1.1/5.8] Photon power-law index for 100MeV-100GeV</td>
</tr>
<tr>
<td>98-101</td>
<td>F.4.2</td>
<td>---</td>
<td>e_Gamma</td>
<td>[0.01/1.1]? 1σ uncertainty in Gamma</td>
</tr>
<tr>
<td>103-104</td>
<td>A2</td>
<td>---</td>
<td>Mod</td>
<td>Spectral model used to fit the energy spectrum (PL, EC or LP) (3)</td>
</tr>
<tr>
<td>106-113</td>
<td>A1</td>
<td>---</td>
<td>Var</td>
<td>[T] Variability flag, 'T'-true (4)</td>
</tr>
<tr>
<td>108-119</td>
<td>A2</td>
<td>Flag</td>
<td>Analysis flag(s); see Table 3</td>
<td></td>
</tr>
<tr>
<td>121-138</td>
<td>A18</td>
<td>---</td>
<td>Assoc</td>
<td>The γ-ray association (5)</td>
</tr>
<tr>
<td>140-141</td>
<td>A1</td>
<td>---</td>
<td>TeV</td>
<td>[E] Pointed or extended source (6)</td>
</tr>
<tr>
<td>142-147</td>
<td>A8</td>
<td>---</td>
<td>Class</td>
<td>Astrophysical class of source (7)</td>
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<tr>
<td>148-173</td>
<td>A26</td>
<td>---</td>
<td>ID</td>
<td>Designator of identified or associated source (8)</td>
</tr>
</tbody>
</table>

**Note (1):** 3FGL JHHMM.m+DDMM can be found in the 3rd EGRET catalog (3EG) (Hartman+, 1999).

**Note (2):** 3FGL JHHMM.m+DDMM can be found in the 3rd EGRET catalog (3EG) (Hartman+, 1999).

**Note (3):** Spectral model used:
- PL = power-law
- EC = power-law with exponential cutoff
- LP = log parabolic
Note (4):
T = <1% chance of being a steady source; see note in text.

Note (5):
Positional associations with 0FGL, 1FGL, 2FGL, 3EG, EGR, or 1AGL.
Sources with multiple y-ray associations are edited on multiple lines.

Note (6):
Flag from association with a TeVCat source:
P = unresolved angular size;
E = extended.

Note (7):
Like "ID" in 3EG catalog (Hartman+, 1999, J/ApJS/123/79), but with
more detail as described in Table 6 (1010 sources are unassociated).
Capital letters indicate firm identifications (238 sources);
lower-case letters indicate associations (1785 sources).

Table 6: LAT 3GL source classes as follows:
PSR = Pulsar, identified by pulsations (343 sources)
psr = Pulsar, no pulsations seen in LAT yet (24 sources)
PMN = Pulsar wind nebula (9 sources; and 2 "pwn")
SNR = Supernova remnant (12 sources; and 11 "snr")
spp = Supernova remnant/pulsar wind nebula (49 sources)
glc = Globular cluster (15 sources)
MHB = High-mass binary (3 sources)
BIN = Binary (1 source)
NOV = Nova (1 source)
SFR = Star-forming region (1 source)
css = Compact steep spectrum quasar (1 source)
Bll = Bl Lac type of blazar (18 sources; and 642 "bll")
FSRQ = FSRQ type of blazar (38 sources; 446 "fsrq")
agn = Non-blazar active galaxy (3 sources)
RDG = Radio galaxy (3 sources; and 12 "rdg")
sey = Seyfert galaxy (1 source)
sbg = Starburst galaxy (4 sources)
NLSY1 = Narrow-line Seyfert 1 (2 sources; and 3 "nlsy1")
ssrq = Soft-spectrum radio quasar (3 sources)

Note (8):
For sources located within the angular extents of extended LAT
sources, this column has the name of the extended source followed by "field".

Byte-by-byte Description of file: table8.dat

Bytes Format Units   Label     Explanations
1- 13  A13   ---     3FGL      The 3FGL name
15- 20  F6.2 10^-8/m2/s F1 [0/538] Integrated 100-300MeV band photon
flux (in 10^-8ph/cm^2/s)
22- 25  F4.2 10^-4/m2/s E_F1 ? Upper limit uncertainty in F1 (1)
27- 30  F4.2 10^-4/m2/s e_F1 ? Lower limit uncertainty in F1 (1)
32- 36  F5.1  ---     TS1       [0/216] Square root of 100-300MeV
band test statistic
38- 43  F6.2 10^-4/m2/s F2 [0/322] Integrated 300-1000MeV band photon
flux (in 10^-8ph/cm^2/s)
45- 48  F4.2 10^-4/m2/s E_F2 ? Upper limit uncertainty in F2 (1)
50- 53  F4.2 10^-4/m2/s e_F2 ? Lower limit uncertainty in F2 (1)
55- 59  F5.1  ---     TS2       [0/569] Square root of 300-1000MeV
band test statistic
61- 67  F7.2 10^-5/m2/s F3 [0/1071] Integrated 1-3GeV band photon flux
(in 10^-9ph/cm^2/s)
69- 72  F7.2 10^-5/m2/s E_F3 ? Upper limit uncertainty in F3 (1)
74- 77  F7.2 10^-5/m2/s e_F3 ? Lower limit uncertainty in F3 (1)
79- 83  F5.1  ---     TS3       [0/712] Square root of 1-3GeV
band test statistic
85- 91  F7.2 10^-5/m2/s F4 [0/2162] Integrated 3-10GeV band photon flux
(in 10^-10ph/cm^2/s)
89- 94  F7.2 10^-5/m2/s E_F4 ? Upper limit uncertainty in F4 (1)
99-103  F7.2 10^-5/m2/s e_F4 ? Lower limit uncertainty in F4 (1)
105-109 F5.1  ---     TS4       [0/466] Square root of 3-10GeV
band test statistic
111-116 F6.2 10^-5/m2/s F5 [0/114] Integrated 10-100GeV band photon flux
118-121 F6.2 10^-5/m2/s E_F5 ? Upper limit uncertainty in F5 (1)
123-126 F6.2 10^-5/m2/s e_F5 ? Lower limit uncertainty in F5 (1)
128-132 F5.1  ---     TS5       [0/112] Square root of 10-100GeV
band test statistic

Note (1): A blank uncertainty limit indicates an infinite value.

Byte-by-byte Description of file: table3.dat

Bytes Format Units  Label     Explanations
1-  2  I2     ---     Flag     [1/12] Flag code
4-350  A347  ---     Note     Explanation text of the flag code
History:
From electronic version of the journal
27-Sep-2015: Insert into VizieR
05-Jul-2019: LCs in ASCII format downloaded from:
http://fermi.gsfc.nasa.gov/ssc/data/access/lat/4yr_catalog/ap_lcs.php
And 3FGL names in Table 8 updated (all "c" components are omitted
in the original MRT file).

(End) Greg Schwarz [AAS], Emmanuelle Perret [CDS] 07-Aug-2015

The document above follows the rules of the Standard Description for Astronomical Catalogues; from this documentation it is possible to generate f77 program to load files into arrays or line by line.