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Authors	Ackermann, M., Ajello, M., Albert, A., Allafort, A., Antolini, E., Baldini, L., Ballet, J., Barbiellini, G., Bastieri, D., Bechtol, K., Bellazzini, R., Siskind, E. J., Spandre, G., Spinelli, P., Suson, D. J., Takahashi, H., Takeuchi, Y., Thayer, J. G., Thayer, J. B., Thompson, D. J., Bottacini, E., Favuzzi, C., Tibaldo, L., Tinivella, M., Torres, D. F., Tosti, G., Troja, E., Tronconi, V., Usher, T. L., Vandenbroucke, J., Vasileiou, V., Vianello, G., Fegan, S. J., Bouvier, A., Vitale, V., Winer, B. L., Wood, K. S., Wood, M., Yang, Z., Brandt, T. J., Bregeon, J., Brigida, M., Bruel, P., Ferrara, E. C., Buehler, R., Buson, S., Caliendo, G. A., Cameron, R. A., CARAVEO, PATRIZIA, Cavazzuti, E., Cecchi, C., Charles, E., Chekhtman, A., Cheung, C. C., Focke, W. B., Chiang, J., Chiaro, G., Ciprini, S., Claus, R., Cohen-Tanugi, J., Conrad, J., Cutini, S., Dalton, M., D'AMMANDO, FILIPPO, de Angelis, A., Franckowiak, A., de Palma, F., Dermer, C. D., di Venere, L., Drell, P. S., Drlica-Wagner, A., Fukazawa, Y., Funk, S., Fusco, P., Gargano, F., Gasparri, D., Monte, C., Germani, S., Giglietto, N., Giordano, F., GIROLETTI, MARCELLO, Glanzman, T., Godfrey, G., Grenier, I. A., Grondin, M. -H., Grove, J. E., Guiriec, S., Monzani, M. E., Hadasch, D., Hanabata, Y., Harding, A. K., Hayashida, M., Hays, E., Hewitt, J., Hill, A. B., Horan, D., Hou, X., Hughes, R. E., Morselli, A., Inoue, Y., Jackson, M. S., Jogler, T., Johannesson, G., Johnson, W. N., Kamae, T., Kataoka, J., Kawano, T., Knodlseder, J., Kuss, M., Moskalenko, I. V., Lande, J., Larsson, S., Latronico, L., Lemoine-Goumard, M., Longo, F., Loparco, F., Lott, B., Lovellette, M. N., Lubrano, P., Mayer, M., Murgia, S., Mazziotta, M. N., McEnery, J. E., Michelson, P. F., Mitthumsiri, W., Mizuno, T., Nemmen, R., Nuss, E., Ohsugi, T., Okumura, A., Omodei, N., Blandford, R. D., Orienti, M., Orlando, E., Ormes, J. F., Paneque, D., Panetta, J. H., Perkins, J. S., Pesce-Rollins, M., Piron, F., Pivato, G., Porter, T. A., Bloom, E. D., Raino, S., Rando, R., Razzano, M., Reimer, A., Reimer, O., Romoli, C., Roth, M., Sanchez-Conde, M., Scargle, J. D., Schulz, A., Bonamente, E., Sgro, C.
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J/ApJ/771/57 Fermi-LAT flaring gamma-ray sources from FAVA (Ackermann+, 2013)

The Fermi All-sky Variability Analysis: a list of flaring gamma-ray sources and the search for transients in our galaxy.

Ackermann M., Ajello M., Albert A., Allafort A., Antolini E., Baldini L., Ballet J., Barbiellini G., Bastieri D., Bechtol K., Bellazzini R., Blandford R.D., Bloom E.D., Bonamente E., Bottacini E., Bouvier A., Brandt T.J., Bregeon J., Brigida M., Bruel P., Buehler R., Buson S., Caliandro G.A., Cameron R.A., Caraveo P.A., Cavazzuti E., Cecchi C., Charles E., Chekhtman A., Cheung C.C., Chiang J., Chiaro G., Ciprini S., Claus R., Cohen-Tanugi J., Conrad J., Cutini S., Dalton M., D'Ammando F., de Angelis A., de Palma F., Dermer C.D., Di Venere L., Drell P.S., Drlica-Wagner A., Favuzzi C., Fegan S.J., Ferrara E.C., Focke W.B., Franckowiak A., Fukazawa Y., Funk S., Fusco P., Gargano F., Gasparrini D., Germani S., Giglietto N., Giordano F., Giroletti M., Glanzman T., Godfrey G., Grenier I.A., Grondin M.-H., Grove J.E., Guiriec S., Hadasch D., Hanabata Y., Harding A.K., Hayashida M., Hays E., Hewitt J., Hill A.B., Horan D., Hou X., Hughes R.E., Inoue Y., Jackson M.S., Jogler T., Johannesson G., Johnson W.N., Kamae T., Kataoka J., Kawano T., Knodlseder J., Kuss M., Lande J., Larsson S., Latronico L., Lemoine-Goumard M., Longo F., Loparco F., Lott B., Lovellette M.N., Lubrano P., Mayer M., Mazziotta M.N., McEnery J.E., Michelson P.F., Mitthumsiri W., Mizuno T., Monte C., Monzani M.E., Morselli A., Moskalenko I.V., Murgia S., Nemmen R., Nuss E., Ohsugi T., Okumura A., Omodei N., Orienti M., Orlando E., Ormes J.F., Paneque D., Panetta J.H., Perkins J.S., Pesce-Rollins M., Piron F., Pivato G., Porter T.A., Raino S., Rando R., Razzano M., Reimer A., Reimer O., Romoli C., Roth M., Sanchez-Conde M., Scargle J.D., Schulz A., Sgro C., Siskind E.J., Spandre G., Spinelli P., Suson D.J., Takahashi H., Takeuchi Y., Thayer J.G., Thayer J.B., Thompson D.J., Tibaldo L., Tinivella M., Torres D.F., Tosti G., Troja E., Tronconi V., Usher T.L., Vandenbroucke J., Vasileiou V., Vianello G., Vitale V., Winer B.L., Wood K.S., Wood M., Yang Z.

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ADC_Keywords: Gamma rays ; Active gal. nuclei ; Cross identifications

Mission_Name: Fermi

Keywords: binaries: general; BL Lacertae objects: general; catalogs galaxies: active; stars: flare; surveys

Abstract:

In this paper, we present the Fermi All-sky Variability Analysis (FAVA), a tool to systematically study the variability of the gamma-ray sky measured by the Large Area Telescope on board the Fermi Gamma-ray Space Telescope. For each direction on the sky, FAVA compares the number of gamma-rays observed in a given time window to the number of gamma-rays expected for the average emission detected from that direction. This method is used in weekly time intervals to derive a list of 215 flaring gamma-ray sources. We proceed to discuss the 27 sources found at Galactic latitudes smaller than 10° and show that, despite their low latitudes, most of them are likely of extragalactic origin.

Description:

We applied FAVA (Fermi All-sky Variability Analysis) to the first 47 months of Fermi/LAT observations (2008 August 4 to 2012 July 16 UTC), in weekly time intervals. The total number of weeks is 206. We considered two ranges of gamma-ray energy, $E > 100\text{MeV}$ and $E > 800\text{MeV}$, to increase the sensitivity for spectrally soft and hard flares, respectively. We generate measured and expected count maps with a resolution of 0.25deg^2 per pixel.

We found LAT counterparts for 192 of the 215 FAVA sources. Most of the associated sources, 177, are AGNs.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table1.dat	85	215	List of FAVA sources
lcs/*	0	216	Plot of weekly flux variations for all 1FAV sources (PDF format)

See also:

- [J/ApJS/199/31](#) : Fermi LAT second source catalog (2FGL) (Nolan+, 2012)
- [J/ApJ/756/33](#) : X-ray sources near 2 γ -ray sources (Cheung+, 2012)
- [J/A+A/548/A106](#) : PMN J0948+0022 radio-to-gamma-ray monitoring (Foschini+, 2012)
- [J/ApJ/743/171](#) : The 2LAC catalog (Ackermann+, 2011)
- [J/ApJ/742/66](#) : New Fermi/LAT extragalactic sources (Teng+, 2011)
- [J/ApJ/741/30](#) : Radio/ γ -ray correlation in AGN (Ackermann+, 2011)
- [J/ApJ/722/520](#) : Gamma-ray light curves of Fermi blazars (Abdo+, 2010)

[J/ApJ/722/L7](#) : Fermi/LAT detected MOJAVE AGNs (Pushkarev+, 2010)
[J/ApJS/188/405](#) : Fermi-LAT first source catalog (1FGL) (Abdo+, 2010)
[J/A+A/370/468](#) : Variability of gamma-ray sources (Torres+, 2001)
[J/ApJS/120/409](#) : The SMM Atlas of Gamma-Ray flares (Vestrand+, 1999)
<http://www.asdc.asi.it/feratel/> : List of sources in Fermi LAT ATels

Byte-by-byte Description of file: [table1.dat](#)

Bytes	Format	Units	Label	Explanations	
1-	8	A8	---	1FAV	FAVA identifier (JHHMM+DD)
10-	14	F5.1	deg	GLON	Galactic longitude
16-	20	F5.1	deg	GLAT	Galactic latitude
22-	24	F3.1	deg	R68	[0.1/0.8] Statistical position error at 68% confidence (1)
26-	28	I3	---	Nf	[1/168] Total number of detected flares
30-	32	I3	---	Nhe	[0/137] Number of flares with detections at high energy
34-	36	I3	---	Nneg	[0/123] Number of flares corresponding to negative flux variations
38-	40	F3.1	deg	Rs	[0.3/1.8] Distance between FAV and counterpart source (2)
42-	58	A17	---	LAT	Associated Fermi-LAT identifier (192 likely counterpart) (2)
60-	63	I4	---	ATel	? ATel publication number
65-	85	A21	---	Assoc	Associated object at longer wavelength

Note (1): The systematic error on the source position is 0.1° .

Note (2): We looked for associations of FAVA sources with previously known variable LAT sources. We searched for counterparts within radius R_s , which is derived as the 99% statistical error plus the systematic error. R_s was deliberately chosen to be large, to include all possible counterparts. In cases for which more than one counterpart is found within R_s , we consider the closest one. We note that the associations were made purely on the basis of positional coincidence. We therefore caution that the associated sources should be considered as likely counterparts only. For a more confident source association, temporal and spectral information need to be considered. See section 3.






History:

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(End) Emmanuelle Perret [CDS] 16-Jan-2015

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