



OPEN DATA @ SSDC

F. Lucarelli

ASI Space Science Data Center (SSDC) and INAF – Oss. Astron. di Roma

on behalf of the SSDC Team





SSDC OVERVIEW

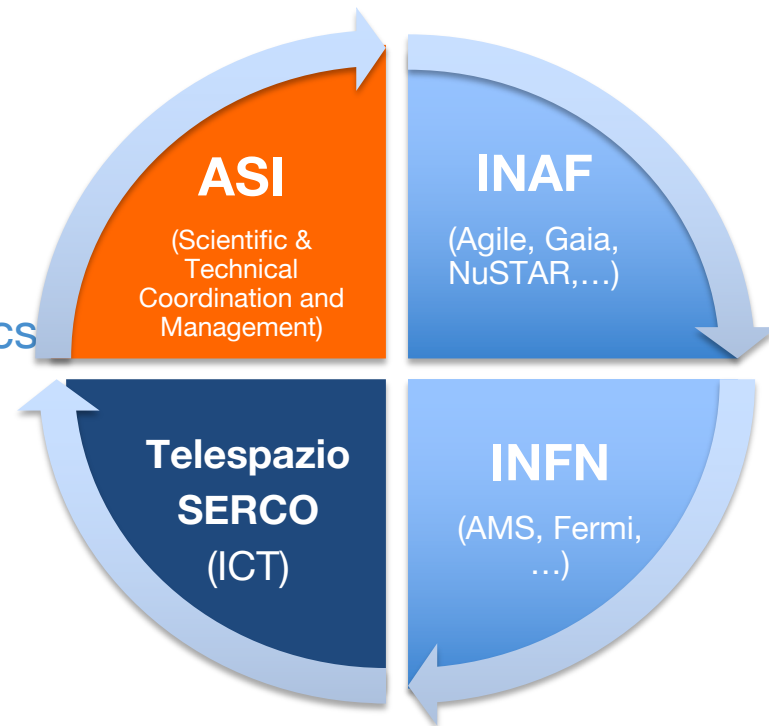
The Space Science Data Center is a Research Infrastructure of the Italian Space Agency

MAIN GOAL

acquire, manage, process and distribute data from (mainly) space based mission adopting the FAIR (Findable, Accessible, Interoperable, Reusable) principles.

- SSDC management and organization involves several Research Institutes:
 - **ASI** – Italian Space Agency
 - **INAF** – National Institute for Astrophysics
 - **INFN** – National Institute for Nuclear Physics

Industries are involved for Information and Communication Technology supports.





Open Data and Open Access @ SSCDC



- Through its main web portal, SSCDC provides 24 hrs/7 days open access to low-level and high-level data and data products of several space missions, mainly operating in the high-energy astrophysics field:
 - X-ray missions: Beppo SAX, SWIFT-XRT, NuSTAR, IXPE, ...
 - Gamma-ray missions: AGILE (reference data center), FERMI-LAT, SWIFT-BAT, EGRET, ...
 - IR-Optics-UV: Herschel, SWIFT-UVOT, Gaia, CHEOPS
- Data and data products are integrated in a fully MWL environment: the Multi-Mission Interactive Archive (MMIA).



Open Data and Open Access @ SSDC

The image shows a screenshot of the Space Science Data Center (SSDC) website. The main header features the SSDC logo on the left and the ASI logo on the right. The title "Space Science Data Center" is prominently displayed in the center. Below the title is a navigation menu with the following items: Home, About SSDC, News and Communication, Quick Look, Missions, **Multimission Archive** (circled in white), Catalogs, Tools, Links, and Bibliographic services. There are also links for Helpdesk and Privacy, and social media icons for Facebook and Twitter.

The main content area is divided into two sections. On the left is a large image of a planetary surface. On the right is a grid of mission icons, including AGILE, SWIFT, NUSTAR, IXPE, AMS-02, S-O2, PAMELA, CSES LIMAOEN, CHEOPS, SOLAR SYSTEM, EUCLID, HERSCHEL, PLANCK, and BIPPO SAX. A white box with a black border and the text "MULTI-MISSION INTERACTIVE ARCHIVE (MMIA)" is positioned over the grid, with a white arrow pointing from the "Multimission Archive" menu item to it.

At the bottom of the page is a footer with several icons and labels: SED BUILDER, SKY EXPLORER, MATISSE, GAIA PORTAL, COSMIC RAY DATABASE, **SSDC MULTIMISSION ARCHIVE FOR SPACE SCIENCE** (circled in white), SSDC CATALOGS, SSDC BIBLIOGRAPHY TOOL, and AGILE-LV3 data analysis.



Multi-Mission Interactive Archive for Space Science Astrophysics/Cosmology

Astrophysics/Cosmology

Exploration of the Solar System

Particle Astrophysics Cosmic rays

Atmospheric Physics TGF

all missions

Radio-Micro wave

Planck

IR-Optic-UV

Herschel
 Swift-UVOT

X ray

ASCA
 BeppoSAX
 Einstein
 Exosat
 NuSTAR
 ROSAT
 Swift-XRT

Gamma ray

Agile
 Agile-LV3
 Egret
 Fermi
 Swift-BAT

all missions

Rosetta
 Dawn
 Chang'E 1
 Chang'E 2
 Messenger

all missions

AMS-01
 AMS-02
 BESS-Polar I
 BESS-Polar II
 CALET
 CREAM
 Fermi-LAT
 Pamela
 TS93
 Chang'E 1 (soon available)
 Chang'E 2 (soon available)

all missions

Agile

Spectral band (Energy (keV)): from **1e-8** to **1e9**

[1.00e-8 keV -- 1.00e9 keV]

Sensitivity (mCrab): 1e3 [1.00e+3 mCrab]

Temporal range (Year): from 1975 to 2019 [1975 -- 2019]

Submit

Source name: **Name Resolver:** SSDC Name Server SIMBAD NED
(e.g. CYGX-1)

Coordinate: RA, DEC L, B Lon, Lat
(e.g. 19 58 21.7, +35 12 05.8 or 299.590333, 35.201611 or 71.334960, 3.066917)

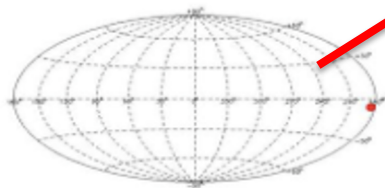


THE MULTI-MISSION INTERACTIVE ARCHIVE

Multi-Mission Interactive Archive

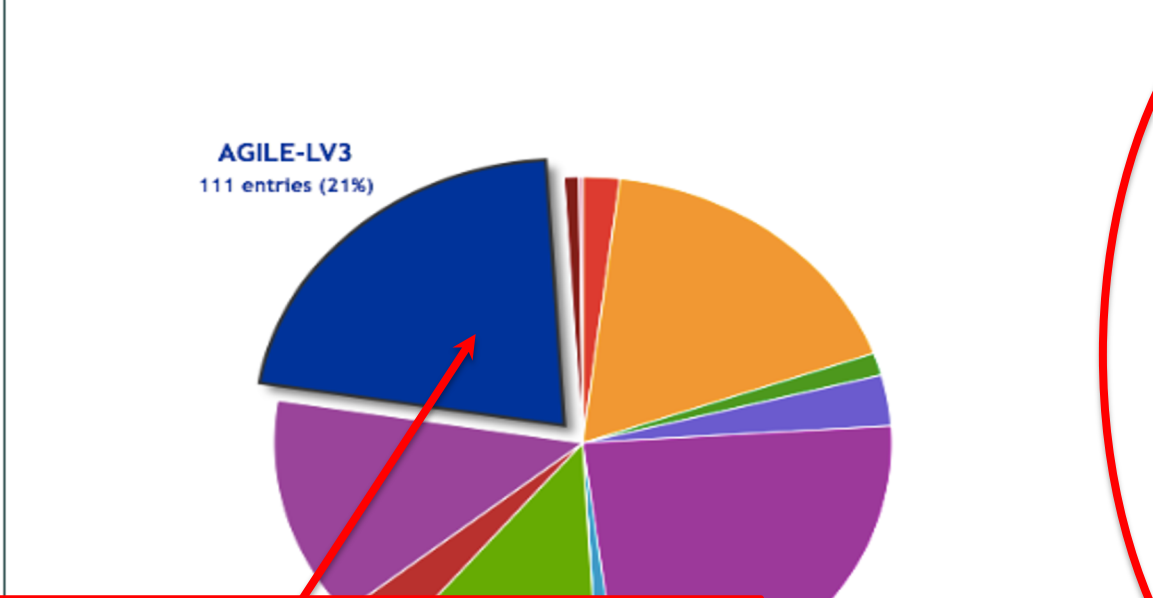
Query results for: **CRAB**
RA = **83.632977** (deg); DEC = **22.014434** (deg);
Source name resolved by **ASDC**

Summary of the observations on the Crab position considering all the data available @ SSCC



Source Names

PKS0531+219
in time range between 1900 and 2017
By name via NED
By coordinates via ADS



MISSION	ENTRIES
PLANCK	0
HERSCHEL	10
SWIFT	91
ASCA	7
BeppoSax NFI	16
BeppoSax WFC	124
EINSTEIN	6
EXOSAT	0
NUSTAR	61
ROSAT	16
AGILE	70
AGILE-LV3	111
EGRET	4
FERMI	1

Clicking on each “piece of the cake” you have access to the corresponding data and interactive data analysis



Open Data and Open Access @ SSDC



- The SSDC portal also hosts high-level data of interest for the cosmology, planetology and cosmic-ray physics community.

The screenshot shows the Space Science Data Center (SSDC) website. At the top, there is a navigation bar with the SSDC logo on the left, the title "Space Science Data Center" in large orange letters, and the ASI logo on the right. Below the navigation bar is a horizontal menu with links: Home, About SSDC, News and Communication, Quick Look, Missions, Multimission Archive, Catalogs, Tools, Links, and Bibliographic services. There are also links for Helpdesk and Privacy, and social media icons for Facebook and Twitter.

Below the navigation bar is a banner for the "Multi-Mission Interactive Archive for Space Science" with the subtitle "Exploration of the Solar System". The banner features images of Earth, Saturn, and Mars.

The main content area is divided into four panels:

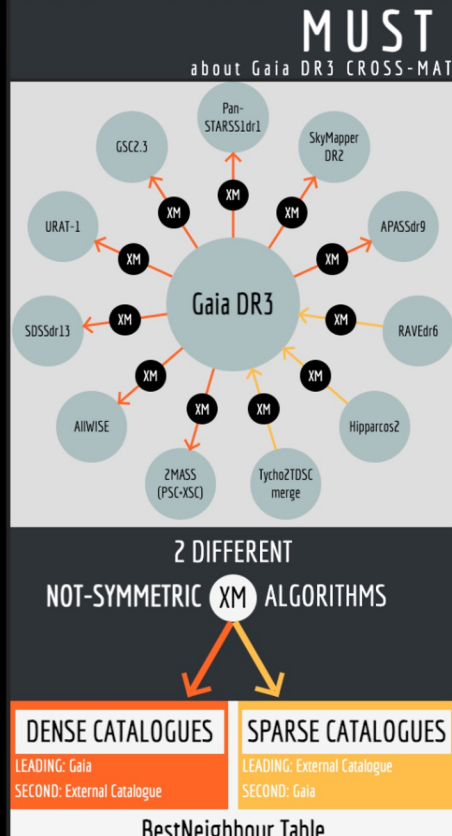
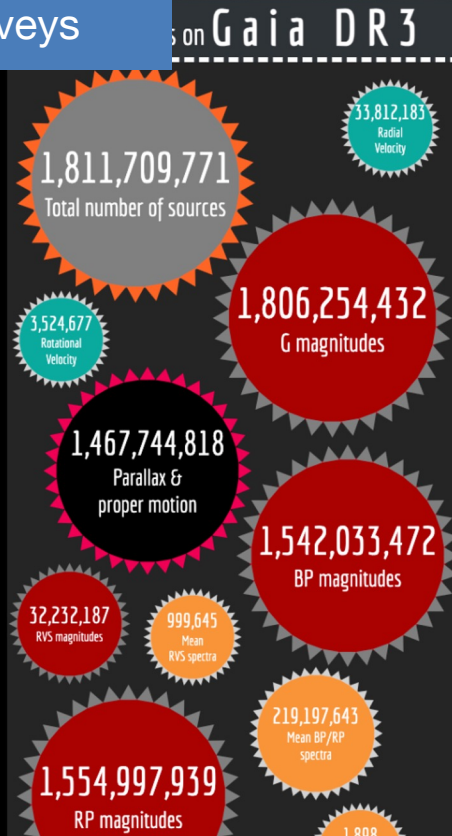
- Astrophysics/Cosmology**: Contains a list of missions under "all missions" with checkboxes. The missions are grouped into "Radio-Micro wave", "IR-Optic-UV", "X ray", and "Gamma ray".
 - Radio-Micro wave: Planck
 - IR-Optic-UV: Herschel, Swift-UVOT
 - X ray: ASCA, BeppoSAX, Einstein, Exosat, NuSTAR, ROSAT, Swift-XRT
 - Gamma ray: Agile, Agile-LV3, Egret, Fermi, Swift-BAT
- Exploration of the Solar System**: Contains a "Target" section with radio buttons for: 1 Ceres, 4 Vesta, 65803 Didymos, Mars, Mercury, Venus. A red button at the bottom says "PVRG magmatic rocks spectra".
- Particle Astrophysics Cosmic rays**: Contains a list of missions under "all missions" with checkboxes: AMS-01, AMS-02, BESS-Polar I, BESS-Polar II, CALET, CREAM, Fermi-LAT, Pamela, TS93, Chang'E 1 (soon available), Chang'E 2 (soon available).
- Atmospheric Physics TGF**: Contains a list of missions under "all missions" with checkboxes: Agile.



Gaia DR3 main table + cross-match with optical-NIR surveys

Gaia DR3 and FPR data

Manage Gaia DR3 XP spectra



XM CONCEPTS

- MATES**
2 Gaia objects with the SAME Best Neighbour in the External Catalogue
- GOOD NEIGHBOURS**
for a given leading catalogue object, a GoodNeighbour is a nearby object in the second catalogue whose position is compatible (within position errors) with the target. All the GoodNeighbours are listed in the Neighbourhood Table.
- BEST NEIGHBOUR**
for a given leading catalogue object, a BestNeighbour is the GoodNeighbour with the highest score. All BestNeighbours are listed in the BestNeighbours Table.
- SCORE**
The score is a Figure of Merit based on geometric distance and local density of the second catalogue. The score is computer for all GoodNeighbours: the higher the score, the better the match.
- XM FLAG**
Is a bitmask indicating which special treatment were applied in the cross-matchin of that particular pair of sources:



SSDC Catalogs

SSDC SPACE SCIENCE DATA CENTER

Space Science Data Center

ASI Agenzia Spaziale Italiana

Home About SSDC News and Communication Quick Look Missions Multimission Archive **Catalogs** Tools Links Bibliographic services

Helpdesk Privacy

SSDC Multi Catalog Search

- VHE —
 - TeV Catalog
 - 1WHSP Catalog
 - 2WHSP Catalog
 - 3HSP Catalog
- Gamma-Ray —
 - AGILE Catalogs
 - Fermi Catalogs
 - Third EGRET Catalog
- X-ray —
 - SuperAGILE
 - BeppoSAX
 - NuSTAR
 - Swift
- UV-optical-NIR —
 - SSDC Catalogs
 - White dwarfs in the SDSS
 - The Plotkin Catalog
- Radio/Microwave —
 - Planck
 - WMAP3
 - WMAP5
 - BOOMERang Blazars
- Multi-frequency —
 - BZCAT Blazars
 - ROXA
 - Sedentary survey
 - GRBase

Media

- SED BUILDER
- SKY EXPLORER
- MATISSE
- GAIA PORTAL
- COSMIC RAY DATABASE
- SSDC MULTIMISSI ARCHIVE P SPACE SCIE

TOP NEWS

FILE-LV3 a analysts

ASI SSDC

Other Science dicembre 2018



Open Science Tools

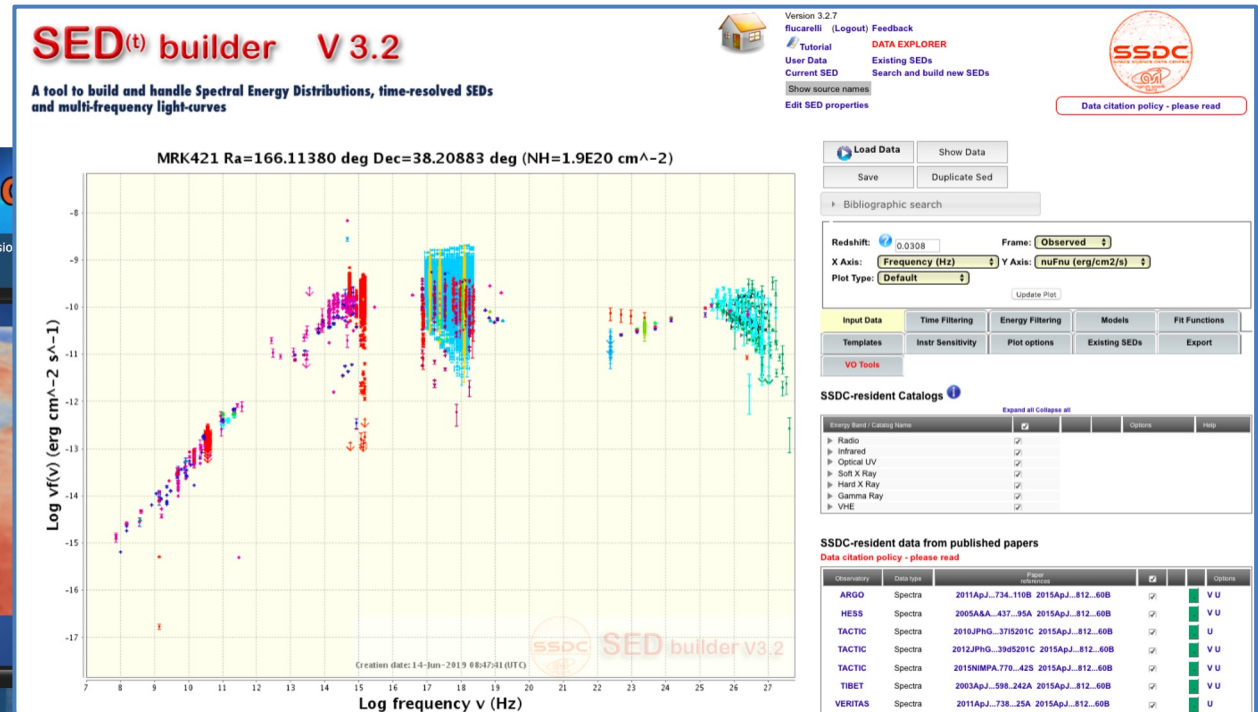
- SSDC offers powerful science tools to extract spectral energy distributions (SEDs) and modelization of sources of interest and to perform on-line scientific analysis.

SSDC Space Science

Home About SSDC News and Communication Quick Look Mission

Helpdesk Privacy

SED^{builder} SKY EXPLORER MATISSE GAIAPORTAL COSMIC RAY DATABASE

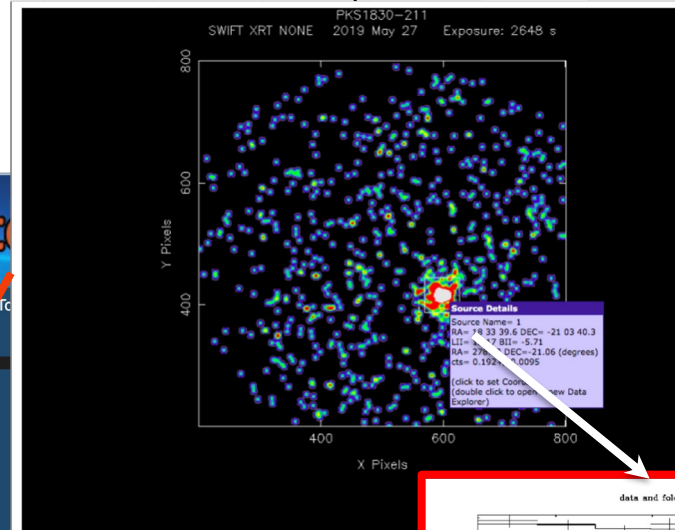




Online science data analysis

SWIFT-XRT quick-look analysis

SWIFT-XRT count map on PKS 1830-211



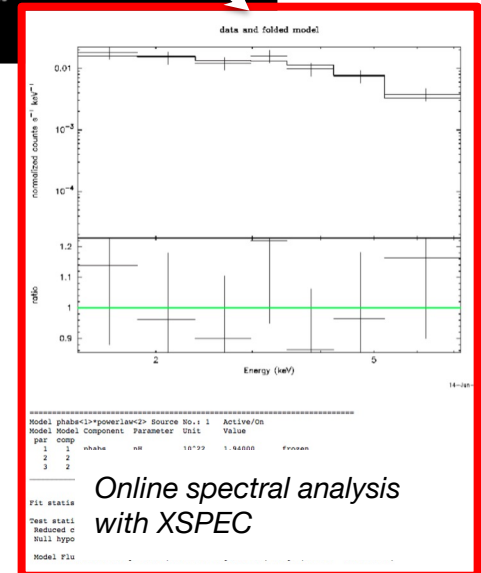
Space Science Data Center

Home About SSDC News and Communication Quick Look Missions Multimission Archive Catalogs Helpdesk Privacy

Swift
AGILE (restricted area)
Fermi
Current Pointings
Swift
AGILE
Fermi

Source ID	RA	Dec	Obs Date	Obs Time	Status	Tools
00075640002	004	saa-cold-148-08	2019-05-27T00:51:35	2019-06-06	FINAL FOR ARCHIVE	XRT Interactive Quick Look UVOT Interactive Quick Look
00031700010	004	1RXSJ150759.8+0	2019-05-27T01:09:13	2019-06-06	FINAL FOR ARCHIVE	XRT Interactive Quick Look UVOT Interactive Quick Look
00038422068	008	PKS1830-211	2019-05-27T01:19:34	2019-06-06	FINAL FOR ARCHIVE	XRT Interactive Quick Look UVOT Interactive Quick Look
03108714002	005	SGWGS-3923	2019-05-27T01:28:35	2019-06-06	FINAL FOR ARCHIVE	XRT Interactive Quick Look UVOT Interactive Quick Look
03109619004	005	PBCJ0224.6-1908	2019-05-27T01:33:35	2019-06-06	FINAL FOR ARCHIVE	XRT Interactive Quick Look UVOT Interactive Quick Look

Navigation: SED BUILDER, SKY EXPLORER, MATISSE, GAIA PORTAL, COSMIC RAY DATABASE, SSDC MULTIMISSION ARCHIVE FOR SPACE SCIENCE, SSDC CATALOGS, BIBLIOGRAPHY TOOL, AGILE-LV3 data analysis





Online science data analysis

AGILE interactive online data analysis



Multi-Mission Interactive Archive

Mission Selected
AGILE-LV3

AGILE-LV3 Tutorials:

- Tutorial LV3.pdf
- video 1, video 2

AGILE Software Manual

WARNINGS and PLANNED UPDATES

Enter source name or coordinates: RA, DEC L, B Lon, Lat
(e.g. CYGX-1 or 19 58 21.7, +35 12 05.8 or 299.590333, 35.201611 or 71.334960, 3.066917)

Name Resolver: SSCC Name Server SIMBAD NED

Start Date: 01-12-2007 End Date: 17-08-2019

Duration: 28 Day(s) Min EXP: 100 cm² s sr

Max lines retrieved: 1000 Equinox: 2000 1950

Submit



AGILE-LV3 Data

Query results for: 3C454.3(SSDC)
 Details: query by **COORDINATE & TIME** with RA = 343.490417; DEC = 16.148056; L = 86.110748; B = -38.183841; Lon = 351.367785; Lat = 21.330631; EQUINOX = 2000; RADIUS = 30 degrees; Start date = 01-09-2009; End date = 17-11-2011; Duration = 28 day(s); Min EXP = 100 cm² s sr; sort by **START DATE**; max lines retrieved 1000;

[Modify AGILE-LV3 query parameters](#)

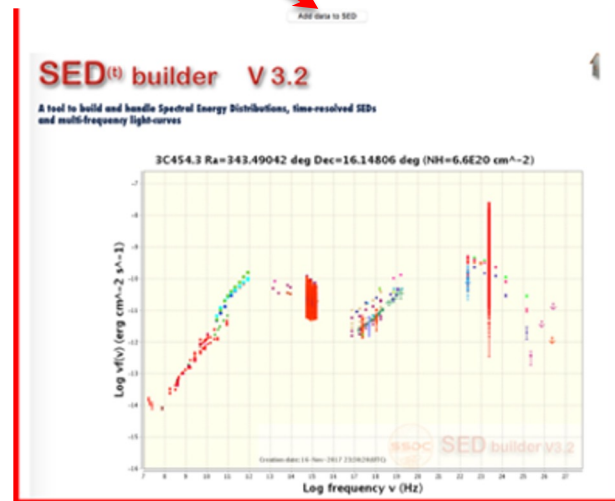
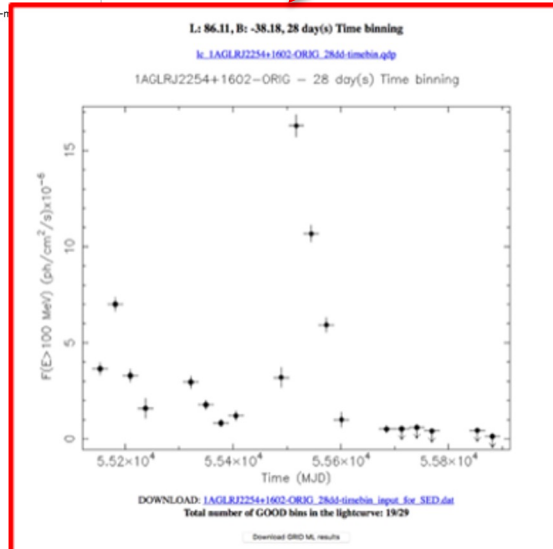
Make Light Curve: LC likelihood

Export Current view of Table In: Latex format FITS format Raw text format CSV text format Browse table

Previous Page Next Page Page Size (# of lines) 200 Reset all filters Show all entries

Line	Start	End	Access	Analysis	Start	End	RA	DEC	Dist. from searched position (degrees)
1	2009-08-31 12:00:00	2009-09-28 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
2	2009-09-28 12:00:00	2009-10-26 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
3	2009-11-04 12:00:00	2009-12-02 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
4	2009-12-02 12:00:00	2009-12-30 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
5	2009-12-30 12:00:00	2010-01-27 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
6	2010-01-27 12:00:00	2010-02-24 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
7	2010-02-24 12:00:00	2010-03-24 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
8	2010-03-24 12:00:00	2010-04-21 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
9	2010-04-21 12:00:00	2010-05-19 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
10	2010-05-19 12:00:00	2010-06-16 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
11	2010-06-16 12:00:00	2010-07-14 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
12	2010-07-14 12:00:00	2010-08-11 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
13	2010-08-11 12:00:00	2010-09-08 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
14	2010-09-08 12:00:00	2010-10-06 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
15	2010-10-06 12:00:00	2010-11-03 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67
16	2010-11-03 12:00:00	2010-12-01 12:00:00	Data Access	Interactive Analysis	22 19 31.19	+04 09 04.67	343.490417	16.148056	14.67

Data access and online analysis



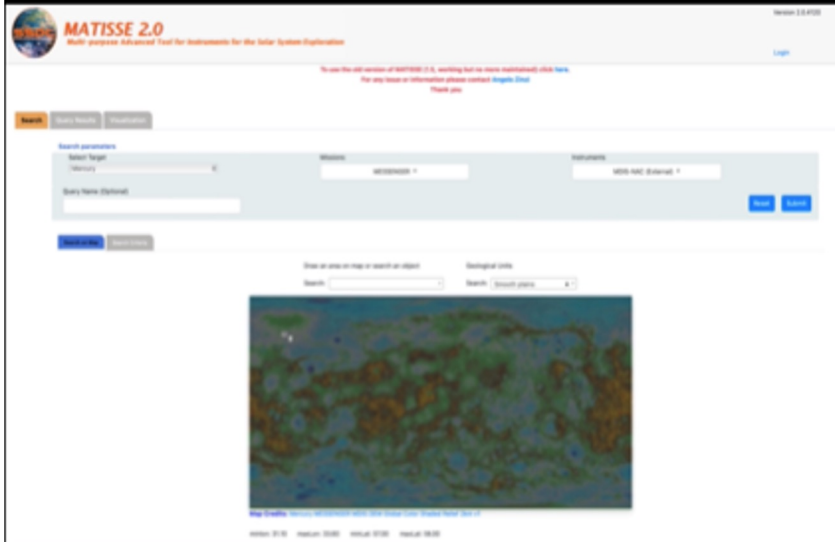


MATISSE Tool

MATISSE (Multi Purpose Advanced tool for Instruments for the Solar System Exploration)

Camplone Veronica, Angelo Zinzi

Completely written in Python 3, MATISSE 2 is now available at <https://tools.ssdc.asi.it/Matisse>



The integration of PLANMAP/GMAP geological maps into MATISSE brings a substantial enrichment to the tool's database. This allows MATISSE users to access detailed, high-quality geological data, which is essential for deeper and more accurate analyzes of celestial bodies.



MATISSE, using the Virtual Observatory (VO) protocol, improves data access and management, promoting standardization and interoperability. This approach helps integrate and share data across various platforms and research initiatives. It enables efficient integration and comparison of data from different missions and instruments, supporting comparative and interdisciplinary research. Collaborations and integrations in MATISSE significantly increase the quantity and quality of data, while simultaneously improving the versatility and functionality of the tool. This makes MATISSE a crucial resource for the scientific community involved in space exploration and planetology.

MATISSE tool gives access to:

- VIR Vesta, Ceres
- CRISM Mars (via PlanetServer)
- MARSIS Mars (restricted access)
- VIRTIS Venus (via EPN-TAP)
- MDIS-NAC Mercury

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VO Tools and SED Builder



SED^(t) Builder

A tool to build and handle spectral energy distributions and multifrequency light curves.



TOPCAT(3): Table Browser

Table Browser for 3: temp_3C279_10651415049481286353.vot

	Nufnu(ergcm ⁻² s ⁻¹)	5GHZ	VMAG	1Kev	User
1	6.695000E-13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	8.305000E-13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	7.458000E-13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	5.428000E-13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	1.480000E-12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	1.450000E-12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Plane Plot (1)

Frame

Legend

STILTS

4: temp

Coords Navigation Range Grid Labels Font

Minimum X:

Maximum X:

X Subrange:

Minimum Y:

Maximum Y:

Position: 10.97, -15.14 Count: 196 / 200

Select Pan X/Y Stretch X/Y Frame X/Y Zoom Iso

VO Tools like TOPCAT can be used to handle SED data in the time domain. TOPCAT is expected to be installed and launched on your computer, before registering.

Warning: Data points for which an observation date is not available are artificially associated to $t_{\text{year}}=2000.0$ equivalent to $t_{\text{MJD}}=51544.0$

Broadcast Type:

Multi Frequency Light Curves

Band:

5 GHZ

VMAG

1 Kev

User defined

Logv_{min} Logv_{max} Label

9.6	9.7	5 GHZ
14.7	14.8	VMAG
17.38	17.39	1 Kev
11	12	User



Register

Registered Clients

- Hub (meta+) (subs+)
- topcat (meta+) (subs+) Send

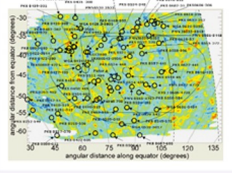


VO ACTIVITIES: CATALOG SAMP CONNECTOR



- A large fraction of SSDC catalog web pages include a VO toolbox to send catalog tables to VO tools, either **TOPCAT** or **Aladin**, using a SAMP connector.

Evidence for a significant Blazar contamination in CMB anisotropy maps



P. Ghose & S. Colafrancesco A&A 414, 7, 2004

Export Current view of Table as: [Table format] [CSV format] [JSON format] [JSON-LD format]

Previous Page Next Page Page Size (x of lines) 200 Reset all filters Show all entries

This view includes 54 entries

Entry number	SSDC	Source name	RA (J2000.0)	DEC (J2000.0)	Flux (mJy)	z	Source Classification	LI (Degrees)	BII (Degrees)
1	SSDC Data Table	Crossmatch SSC Catalog	PKS 0252-549	02 52 35.79	-54 41 48.93	1193	FSRQ - WMAP	272.48	-54.62
2	SSDC Data Table	Crossmatch SSC Catalog	PKS 0257-510	02 58 29.7	-50 52 16.91	452	FSRQ	266.21	-56.21
3	SSDC Data Table						NED: QSO	278.11	-48.95
4	SSDC Data Table						Blazar candidate	271.2	-51.89
5	SSDC Data Table						Blazar Candidate	271.9	-50.46
6	SSDC Data Table						NED: Radio S. Extended - WMAP	240.18	-56.96
7	SSDC Data Table						QSO	239.34	-52.86
8	SSDC Data Table						FSRQ	237.73	-48.49
9	SSDC Data Table						FSRQ - WMAP	241.28	-47.9
10	SSDC Data Table						NED: QSO	260.51	-45.38
11	SSDC Data Table						Blazar candidate	229.66	-44.58
12	SSDC Data Table						NED: QSO	241.76	-44.92
13	SSDC Data Table						FSRQ	241.87	-44.45
14	SSDC Data Table						FSRQ - WMAP	240.65	-44.41
15	SSDC Data Table						BL Lac	240.92	-43.6
16	SSDC Data Table						Blazar candidate	236.92	-42.69
17	SSDC Data Table						NED: QSO	270.84	-40.16
18	SSDC Data Table						FSRQ	230.26	-40.74
19	SSDC Data Table						FSRQ - WMAP	248.4	-41.57



Connect to SAMP

TOPCAT

Graphics Joins Windows VO Interop Help

TOPCAT(1): Table Browser

Window Rows Help

Table Browser for 1: boomerang

	name	Ra	Dec	Rflux	Vmag	Redshift	classification	li	bii
1	PKS 0252-549	43.3783	-54.6947	1193.	17.7	0.537	FSRQ - WMAP	272.48	-54.62
2	PKS 0257-510	44.6571	-50.8711	452.	23.	0.834	FSRQ	266.21	-56.21
3	PKS 0308-611	47.48167	-60.9743	1103.	18.6		NED: QSO	278.11	-48.95
4	PKS 0310-558	48.02417	-55.69389	501.	18.		Blazar candidate	271.2	-51.89
5	PKS 0317-570	49.73333	-56.84778	257.	17.5		Blazar Candidate	271.9	-50.46
6	PMN J0321-3711	50.3467	-37.1925	5020.			NED: Radio S. Extended - WMAP	240.18	-56.96
7	PKS 0340-372	55.5225	-37.05305	872.	18.1	0.284	QSO	239.34	-52.86
8	PKS 0402-362	60.9712	-36.08	1132.	17.2	1.417	FSRQ	237.73	-48.49
9	PKS 0405-385	61.7446	-38.4397	830.	17.7	1.285	FSRQ - WMAP	241.28	-47.9
10	PKS 0410-519	62.90083	-51.82222	361.	17.5		NED: QSO	260.51	-45.38
11	PMN J0419-3010	64.9512	-30.1686	184.	17.5		Blazar candidate	229.66	-44.58
12	PMN J0422-3844	65.5612	-38.7467	130.	17.	3.11	NED: QSO	241.76	-44.92
13	WGA J0424.6-3849	66.1637	-38.8172	309.	18.5	2.34	FSRQ	241.87	-44.45
14	PKS 0422-380	66.1742	-37.94	1706.	18.1	0.782	FSRQ - WMAP	240.65	-44.41
15	WGA J0428.8-3805	67.2104	-38.0956	51.	16.5	0.15	BL Lac	240.92	-43.6
16	1RXS J043208.7-35065	68.0362	-35.1142	182.	18.		Blazar candidate	236.92	-42.69
17	PKS 0432-606	68.39208	-60.50389	636.	19.		NED: QSO	270.84	-40.16
18	PKS 0435-300	69.4062	-29.9031	691.	17.2	1.328	FSRQ	230.26	-40.74
19	J0438-43	70.0738	-43.5489	3933.	18.8	2.852	FSRQ - WMAP	248.4	-41.57

Total: 54 Visible: 54 Selected: 0

Table Properties

Label:

Location:

Name:

Rows:

Columns:

Sort Order:

Row Subset:

Row Actions:

Client: SSDC

topcat Send



VO Tools and SSDC Catalogs

NuBlazar - The first hard X-ray spectral catalogue of Blazars observed by NuSTAR

Last update: 5-July-2022

Space Science Data Center

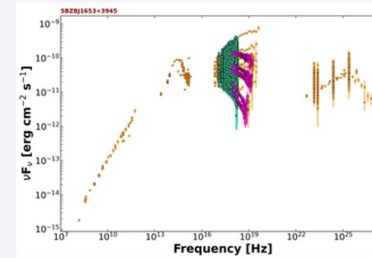
SSDC catalogs

On-line interactive version of catalogs produced at SSDC or with the contribution of SSDC staff

VHE Gamma-Ray X-Ray UV-optical-NIR Radio-Microwave Multi-frequency Non-Astronomical All SSDC catalogs

NuBlazar

- Fermi LBAS - The LAT Bright AGN Source List (Abdo, Ackermann, Ajello et al. 2009, *AJ*, 700, 597)
- PVRG magmatic rocks spectra - Spectral Database for Silicate Glasses with Natural Composition
- NuBlazar - The first hard X-ray spectral catalogue of Blazars observed by NuSTAR - Middel et al. 2022, *MNRAS*, 514, 3179
- Palermo BAT - The Palermo Swift-BAT hard X-ray catalogue III. Results after 54 months of sky survey - Calzavara et al. 2016, *AA*, 534, 64
- Planck ERCSC - The Planck Early Release Compact Source Catalogue, released by ESA on January 11th, 2011, *AA*, 536, A7, 2011
- Planck PCCS1 - The Planck Catalogue of Compact Sources, released by ESA on March 21st, 2013, *AA*, 571, A26, 2014
- Planck PCCS2 - The 2nd Planck Catalogue of Compact Sources, released by ESA on July 9th, 2015, *AA*, 592, A26
- ROXA - The Radio Optical X-ray SSC (ROXA) blazar sample - Turisiani, Cavazzuti & Giommi 2007, *AA*, 472, 659
- Sedentary survey - The Sedentary Multi-frequency Survey - Giommi, Piranomonte, Perri & Padovani 2005, *AA*, 434, 385
- SuperAGILE - Monitoring the hard X-ray sky with SuperAGILE - Perri et al., 2016, *AA* 510, 49



Connect to SAMP

Search table columns

Cone Search

Source Name

Resolve name and search

RA, Dec, L, B Clean

radius 5 Search

Reset filter

HBL IBL LBL

5BZBJ1653+3945

R. Middel, P. Giommi, M. Perri et al., 2022, *MNRAS*, 514, 3179

Export Current view of Table in: [Latex format](#) [FITS format](#) [Raw text format](#) [CSV text format](#) [Browse table](#)

Previous Page Next Page Page Size (# of lines) 200 Reset all filters Show all entries

This view includes 7 entries

MMC	Source Name	RA (J2000.0) hh mm ss.d	Dec (J2000.0) dd mm ss	Photon index with error	Flux 3-10 keV pl ($\text{erg/cm}^2/\text{s}$)	Flux 10-30 keV pl ($\text{erg/cm}^2/\text{s}$)	Blazar Type		
1	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.26±0.02	(4.97±0.01)e-11	(3.36±0.01)e-11	HBL
2	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.23±0.01	(7.06±0.01)e-11	(4.94±0.02)e-11	HBL
3	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.10±0.01	(1.706±0.003)e-10	(1.393±0.004)e-10	HBL
4	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.12±0.01	(1.542±0.003)e-10	(1.233±0.004)e-10	HBL
5	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.20±0.01	(4.49±0.01)e-11	(3.27±0.01)e-11	HBL
6	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.69±0.03	(1.687±0.007)e-11	(6.97±0.06)e-12	HBL
7	SSDC Data Explorer	Cross-search SSDC catalogs	5BZBJ1653+3945	16 53 52.21	+39 45 37	2.74±0.04	(9.59±0.05)e-12	(3.70±0.04)e-12	HBL

A new SSDC TAP registry has been recently created: a few catalogs are currently available, and we are working considerably to increase their number.



SUMMARY

- The ASI-SSDC strongly pursues the *Open Science* paradigm since its beginning, allowing free 24/7 days access to space mission data, and fully adopting the FAIR principles.
- The MWL SSDC environment provides several unique features and tools (*SEDBuilder*, *SkyExplorer*, *Matisse*, Gaia Portal, Source Catalogs, ...) that can support a large part of the astronomical community, from HE astrophysics to cosmology, planetology and cosmic-ray physics.
- The SSDC online science analysis tools allow the users to perform data analysis without the need for local space resources or software installations.
- All services and tools are frequently updated (web server and security upgrades, improved graphical layouts, new features added, ...) in close synergy with the industrial support.
- Most of the SSDC tools and catalogs can directly generate tables and products compliant with the VO standards and tools.



SSDC STAFF

SSDC team involves around 40 people: scientists from ASI, INAF, INFN and SW engineers from Telespazio & SERCO, experts in different fields.

SSDC Management	
Gianluca Polenta (ASI)	Director
Valerio D'Elia (ASI)	Universe Observation Manager
Marco Giardino (ASI)	ICT Manager
Matteo Perri (INAF)	INAF Project Scientist
Matteo Duranti (INFN)	INFN Project Scientist

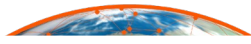
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Paolo Giommi (ASI)	Open Universe	
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Ernesto Palomba (INAF-IAPS Roma)	ESS (Solar System Exploration Missions)	
Elena Pancino (INAF-Osservatorio Astrofisico Arcetri)	GAIA	
Antonio Stamerra (INAF-OA Roma)	MWL, CTA, Fermi	
Simona Zoffoli (ASI)	LIMADOU	

ssdc.asi.it



BACKUP SLIDES

Multi-Mission Interactive Archive for Space Science

Particle Astrophysics/Cosmic rays

Astrophysics/Cosmology

Exploration of the Solar System

Particle Astrophysics
Cosmic rays

Atmospheric Physics
TGF

all missions

Radio-Micro wave

Planck

IR-Optic-UV

Herschel

Swift-UVOT

X ray

ASCA

BeppoSAX

Einstein

Exosat

NuSTAR

ROSAT

Swift-XRT

Gamma ray

Agile

all missions

Rosetta

Dawn

all missions

AMS-01

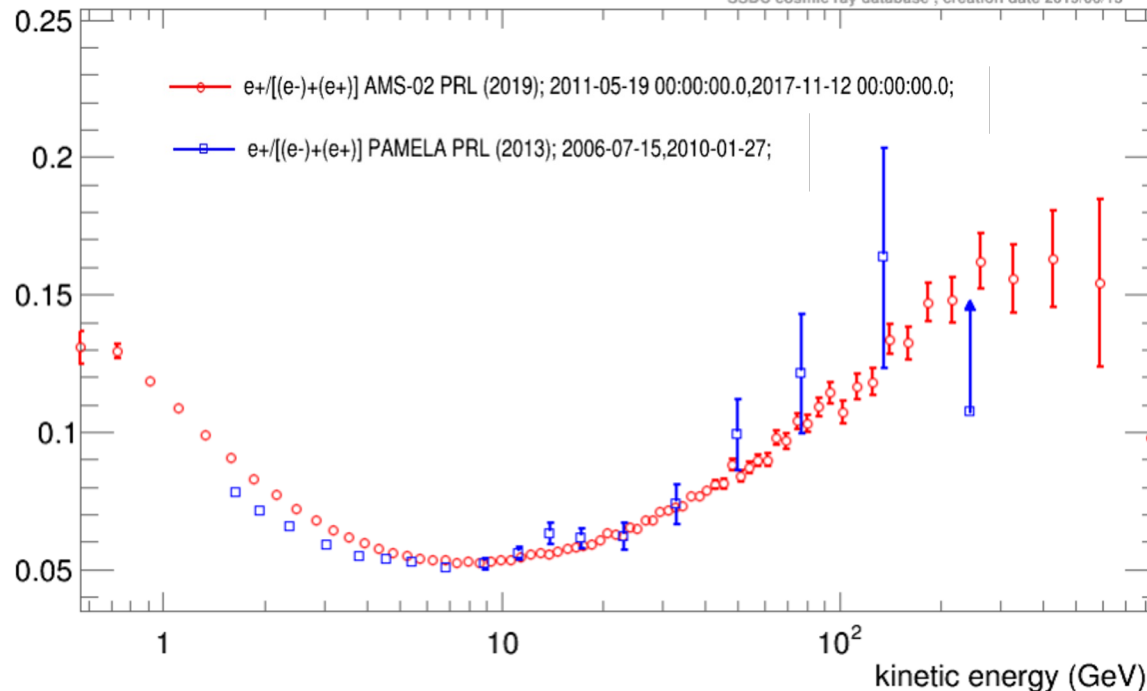
AMS-02

all missions

Agile

Particle name:

fluxratio



Multi-Mission Interactive Archive for Space Science

Earth's Atmosphere/Terrestrial Gamma-Ray Flashes

Astrophysics/Cosmology

all missions

Radio-Micro wave

X ray

Gamma ray

Entry number	TGF ID	GeoLon	GeoLat	Date (UTC)	Trigger Time T0 (MET in s)	T0_micro (μs)	T50 (ms)
1	150323.96107	119.48	-1.48	2015-03-23T23:03:57	354236637	71008	27
2	150324.45177	118.06	1.5	2015-03-24T10:50:33	354279033	734131	67
3	150402.21858	119.59	1.7	2015-04-02T05:14:46	355036486	427986	66
4	150405.44417	118.36	-2.23	2015-04-05T10:39:37	355315177	748350	35
5	150410.28321	120.47	-1.93	2015-04-10T06:47:50	355733270	254365	40
6	150411.25532	118.7	1.94	2015-04-11T18:07:40	355860460	609292	175
7	150422.62361	121.22	2.41	2015-04-22T14:58:00	356799480	476284	31

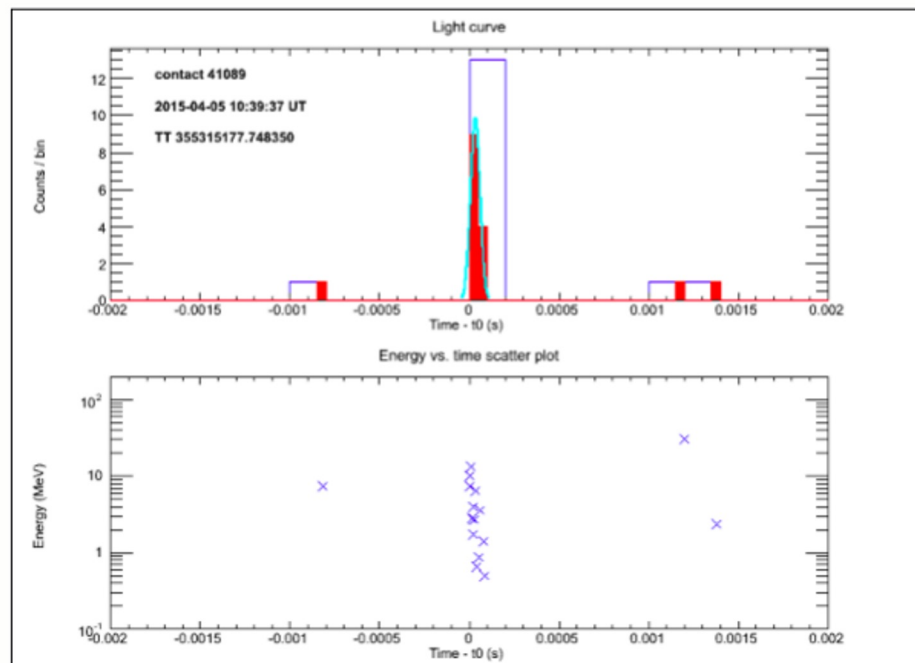
Swift-XRT

AGILE MCAL Data Products Source Details

Standard Products

Light Curve Legend:

- Blue histogram: 200 microsec time bin
- Red filled histogram: finer binning 50 microsec
- Cyan curve: maximum likelihood Gaussian fit



TGF catalog: AGILE-MCAL Enhanced TGF Catalog (Period: March

Date UTC (YYYY-MM-DD) from: 2015-03-23 to: 2015-

Geo-Longitude [-180.00,+180.00]: 0.00 (deg) Longitude interval ±: 180.00 (deg)

Submit



LINK TO SSDC MWL TOOLS

134 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
135 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
136 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
137 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
138 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
139 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
140 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
141 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs
142 <input checked="" type="checkbox"/>	Select	SSDC Data Explorer	Cross-search SSDC catalogs

Entry TeV J1959+6508
 R A (J2000) = 19 59 59.9 (299.9996 deg) l=98.00
 Dec (J2000) = +65 08 54.7 (65.1485 deg) b=17.67
 Galactic nH = 1.00E+21 (cm⁻²) [Source Names](#)

Error circle EXPLORER Source Details Feedback

TUTORIAL HELP

Default catalogs (always selected)

Selectable catalogs:

- Default selection (1)
- Radio [select]
- Infrared [select]
- Optical [select]
- X-Ray [select]
- Gamma [select]

Source Catalogs [select]
 [Selected catalog List >>]

size (arcmin) [60]

[show source list](#)
[download image in .ps format](#)

[show source list](#)
[download image in .ps format](#)

Position selected for the analysis: R A = 19 59 59.9 (299.9996 deg) l=98.00
 Dec = +65 08 54.7 (65.1485 deg) b = 17.67 [SED Builder](#) [Source Names](#)
 Galactic nH = 1.00E+21 (cm⁻²)

Additional Services -

SSDC-resident astronomical catalogs

Group of Catalogs Selected Catalogs

Radio IR Optical X-ray Gamma QORG AGN BZCAT ZCAT NGC ZWICKY

Search radius: [0.2] arcmin

Search Other Services

VIZIER(X-R-G) VIZIER(O-IR) NED SIMBAD HEASARC(X-R-G) GSC2 STSCIMAST 2MASS SDSS USNO-B1.0 NVO

Search radius: [0.2] arcmin

Bibliography search

BZJ1959+6508
 in time range between 1900 and 2018
 By name via NED
 By coordinates via ADS

Access to Public Data Archives -

Queries to single data archives

Gamma Ray Data

AGILE Fermi EGRET

Search radius: [50] degrees

Multiple queries to SSDC data archives

Spectral band [all]

Radio-Micro wave
 IR-Optic-UV
 X-ray
 Gamma ray

PWN

SNR/MC

PWN/SNR

HBL

HBL

IBL

HBL

PWN/SNR

PWN/UNID

SkyExplorer

F. Lucarelli – Open Science @ INAF – Rome, 14-15/12/23

22



SEARCH FOR EM NEUTRINO COUNTERPARTS: THE CASE OF IC-160731

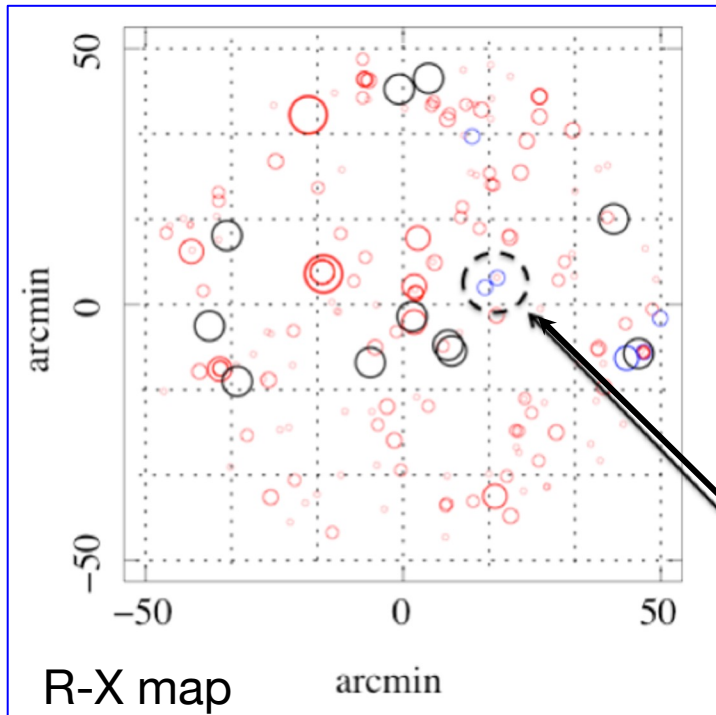


- Extremely High Energy (EHE) neutrino detected by the ICECUBE experiment at **T0=31/07/2016 01:55:04 UTC**
- Reconstructed arrival direction:
RA,DEC (J2000)=(214.54, -0.33) +/- 0.75 [deg]
(90% stat+sys containment radius)
Gal Coords. $l,b=(343.68, +55.52)$ deg
- No known blazars/LAT sources found inside the ICECUBE-160731 error circle.
- Possible AGILE gamma-ray transient (AGL J1418+0008) seen in correspondence of IC-160731.

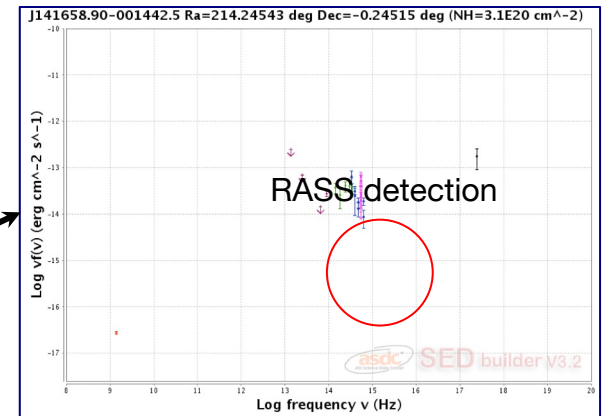
Use SSDC tools (*SkyExplorer* & *SEDBuilder*)
to identify the possible EM counterpart

SEARCH FOR EM NEUTRINO COUNTERPARTS: THE CASE OF IC-160731

Search around IC-160731/AGL
J1418 using SSDC
SkyExplorer tool



SSDC SEDBuilder Tool

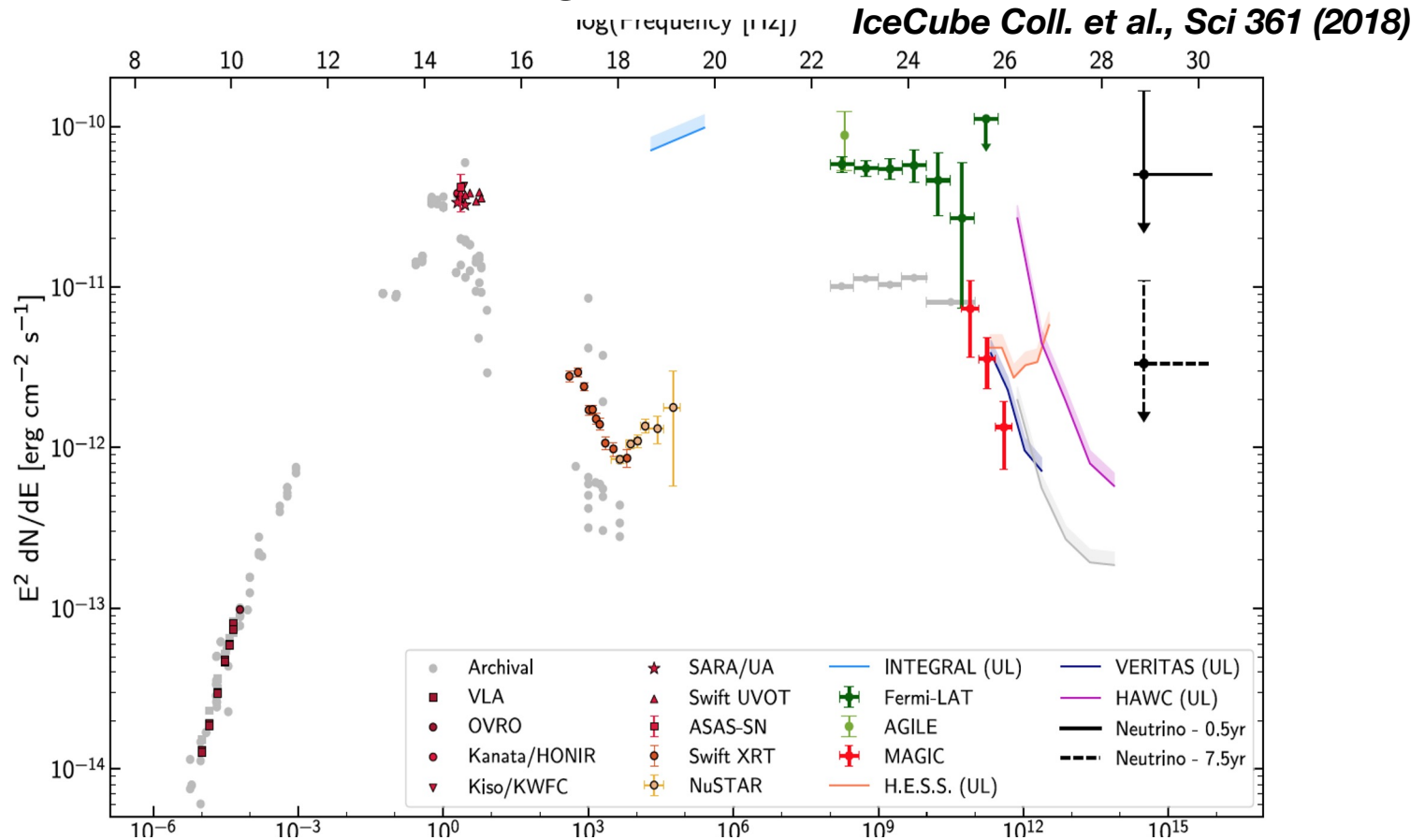


 FIRST detection (~2mJy)

1RXS J141658-00144:
possible HBL blazar candidate □
ICECUBE-160731 emitter candidate?

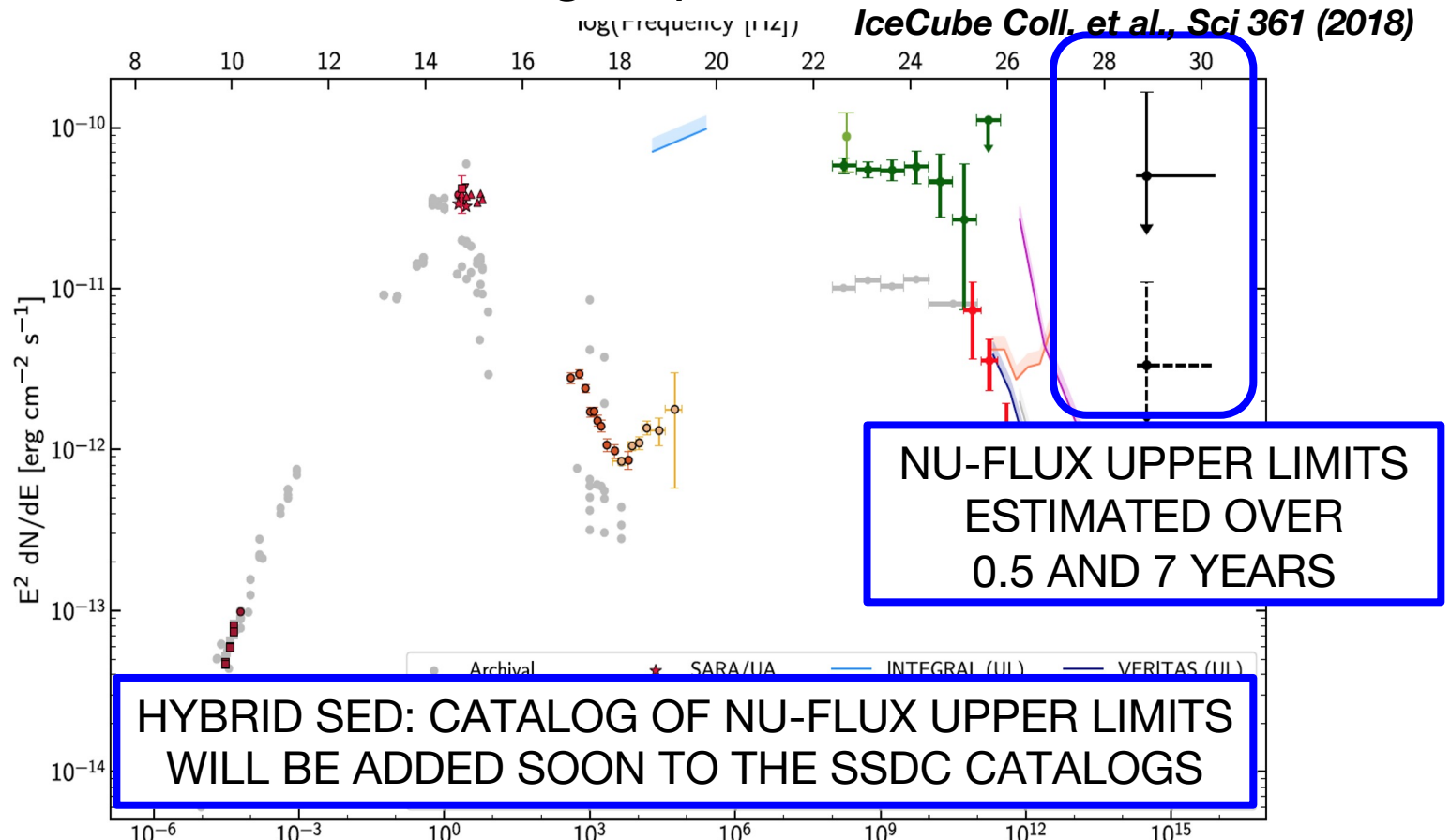
THE CASE OF TXS 0506+056

- First source of VHE neutrinos: gamma/nu correlated emission observed during Sept. 2017.



THE CASE OF TXS 0506+056

- First source of VHE neutrinos: gamma/nu correlated emission observed during Sept. 2017.



Archival observations (in gray) retrieved from the SSDC *SEDBuilder*