VO and its role on BSDC & Open Universe

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On behalf of the BSDC collaboration

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Contents

- About **high-level** *data*
- **Virtual Observatory**, features
- The **BSDC** & **ASDC** *partnership*
  - & the **Open Universe**
- How can we **improve**

Data

- Data: a set of structured information
  - Data itself -- the ultimate information of our interested -- comes with ‘metadata’, stored in a (set of) file(s) (or db)

To make use of a data set we have to
  Read data out of the file(s)
  Identify the content
  Pre-process it
  Analyse

In three -- out of the four -- steps we can help our users

high-level Data

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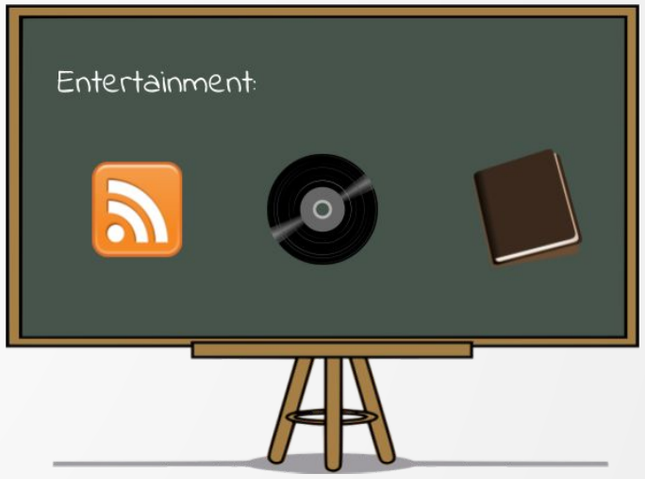

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Virtual Observatory

"*the vision that astronomical datasets and other resources should work as a seamless whole.*"

VO is …

an abstract system which uses a common set of technologies and standards. The idea is to have inter-operable resources. It also requires some specialized middleware to glue things together.

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Virtual Observatory

- *Standards*
  - Metadata
- Resources
  - Catalogs, Spectra, Images, Documents, etc
- Services
  - SCS, SSA, SIA, TAP
  - ADQL

Unified Content Descriptors (UCDs)
Units

A path to follow

ASDC — BSDC — Open Universe

- The ASDC example
  - Multi-mission archive: 23 space missions, 13 currently active
  - Interactive data analysis: SED, data explorer, imaging
  - Online data reduction
- Open Universe initiative

  “for expanding availability of and accessibility to open source space science data”

  - Multi-interface to data
    - research
    - exploration
  - Open access

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To **implement** together with the Brazilian **community** a **high-level**, lightweight **data-analysis** infrastructure

BSDC & Open Universe +VO

DATA

- Catalog and Image services
- As publisher (BSDC):
  - To provide “*science-ready*” data
- As consumer (OpenUniverse):
  - To select *high-quality* data services

Beyond high-quality data: *meta-complete*.
Metadata allows data to be used optimally.

BSDC & Open Universe +VO

TOOLS

- On (pre)processing:
  - To automate data publishing
  - To ease data discovery
  - To reprocess data in real time
- On analysis:
  - To identify, extract and re-structure data so that the user explores the information

A better use of/for Data

- The “science ready” data
  - provide the interface to data-driven science
    - curated data & metadata
    - approximate data producers and analysts
  - value-added from experts' interoperability
- To boost knowledge extraction from data

BSDC activities

- Implementation of a VHE extragalactic database integrated with SED builder
  - MAGIC publications catalog
  - VERITAS-blazars database
- Development of temporal cross-correlation analysis
- Development of a polarimetry database, analysis tools
- ASDC' Swift pipeline

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BSDC-VO Home
vo.bsdc.icranet.org
BSDC
BSDC-VO
Welcome to BSDC VO interface. The catalogues you'll find should also be accessible through IVO managed services, like SCS, SSAP and TAP protocols.
Please check out for the additional services provided numerous tables using TAP or form-based ADQL.
site help
Services Available
By Title
By Subject
By Author
1WHSP blazar candidates catalog
Magic Public Spectra Web Interface
Authors
Description
The MAGIC project observes the VHE sky (GeV~TeV) through Cherenkov radiation events. The project is operating since 2004 and with the support from the Spain-VO team they provide data access through a VO-SSAP and web services. Our goal here is to provide the same kind of service with the difference that the data is transformed and homogeneized in its flux units, to values in 'erg/(s.cm2)', and photon energy values in equivalent 'Hz' frequency values.
SDSS-DR10 white dwarfs catalog
UHECR

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RofR: IVOA Registry of Regist
rofr.ivoa.net
[-] Currently Registered Publishing Registries
These publishing registries have successfully register with the RofR after a full validation. These are the registries that the full searchable registries are pulling records from. This list is generated on-the-fly via a query to the RofR's harvesting interface.
Sternberg Astronomical Institute Catalog Access Services Publishing Registry
IVOA Identifier: ivo://astronet.ru/cas/registry
OAI service endpoint: http://vo.astronet.ru/cas/registry.php
VizieR publishing registry
IVOA Identifier: ivo://CDS.VizieR/registry
OAI service endpoint: http://cdsweb.u-strasbg.fr/reg-bin/vizier/oai.pl
MSSL Publishing Registry
IVOA Identifier: ivo://mssl.ucl.ac.uk/org.astrogrid.registry.RegistryService
OAI service endpoint: http://msslkk.mssl.ucl.ac.uk/mssl-registry/OAIHandlerv1_0
AIP DaCHS Registry
IVOA Identifier: ivo://aip.gavo.org/__system__/services/registry
OAI service endpoint: http://gavo.aip.de/oai.xml
Argentine Virtual Observatory Registry
IVOA Identifier: ivo://ar.nova/__system__/services/registry
OAI service endpoint: http://nova.iafe.uba.ar/oai.xml
STScI Searchable Registry
IVOA Identifier: ivo://archive.stsci.edu/nvoregistry
OAI service endpoint: http://vao.stsci.edu/directory/oai.aspx?
ATNF Publishing Registry
IVOA Identifier: ivo://au.csiro/org.astrogrid.registry.RegistryService
OAI service endpoint: http://datanet.csiro.au:80/astrogrid-registry/OAIHandlerv1_0
BSDC-VO Registry
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OAI service endpoint: http://vo.bsdc.icranet.org/oai.xml
CADC Registry
IVOA Identifier: ivo://cadc.nrc.ca/registry
OAI service endpoint: http://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/reg/OAIHandlerv1_0
Smithsonian Astrophysical Observatory Telescope Data Center Registry
IVOA Identifier: ivo://cfa.tdc/__system__/services/registry
OAI service endpoint: http://oirsa.cfa.harvard.edu:8080/oai.xml
ALMA ChiVO DaCHS Registry

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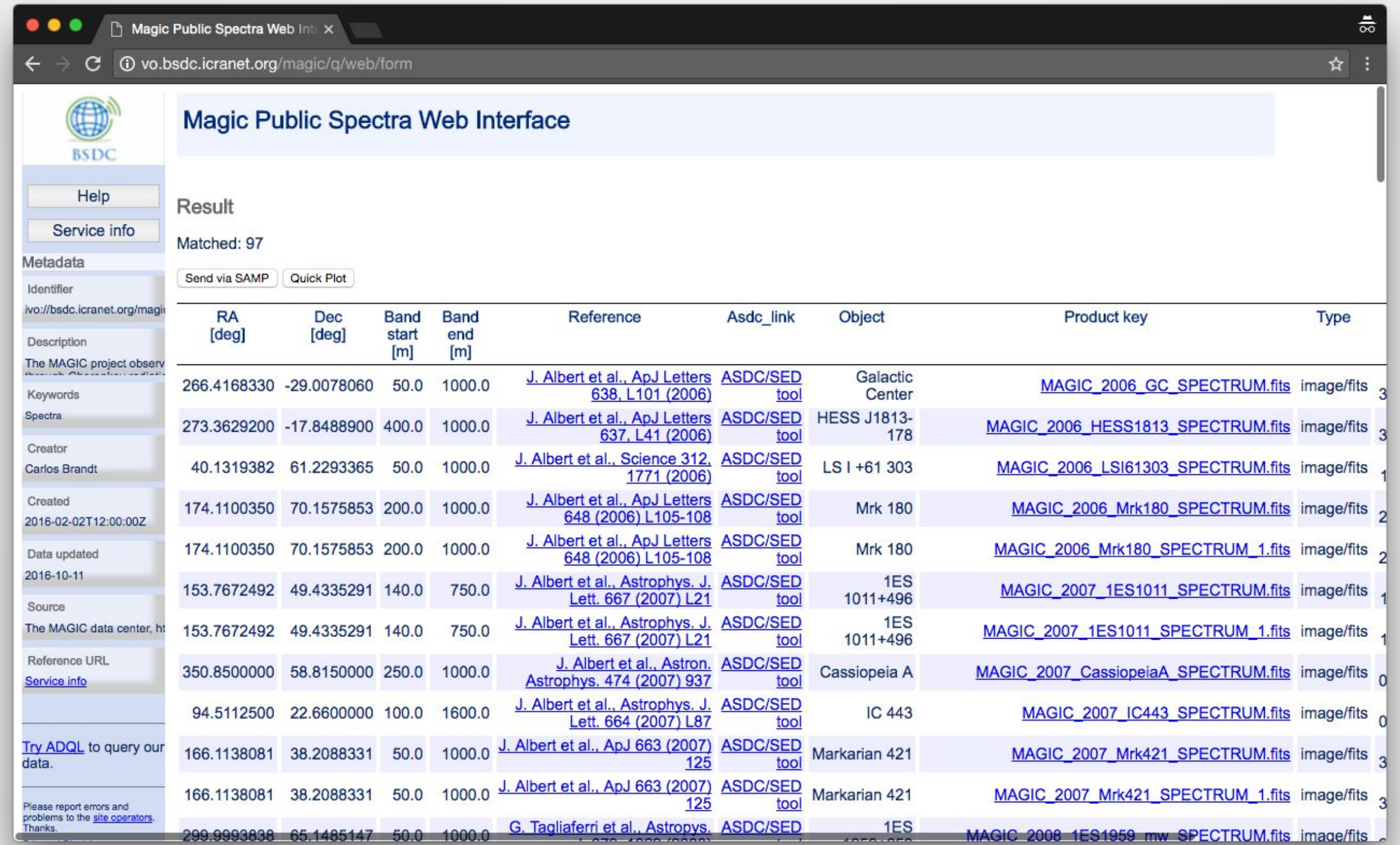

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174.1100350	70.1575853	200.0	1000.0	J. Albert et al., ApJ Letters 648 (2006) L105-108	ASDC/SED tool	Mrk 180	MAGIC_2006_Mrk180_SPECTRUM_1.fits	image/fits	2
153.7672492	49.4335291	140.0	750.0	J. Albert et al., Astrophys. J. Lett. 667 (2007) L21	ASDC/SED tool	1ES 1011+496	MAGIC_2007_1ES1011_SPECTRUM.fits	image/fits	1
153.7672492	49.4335291	140.0	750.0	J. Albert et al., Astrophys. J. Lett. 667 (2007) L21	ASDC/SED tool	1ES 1011+496	MAGIC_2007_1ES1011_SPECTRUM_1.fits	image/fits	1
350.8500000	58.8150000	250.0	1000.0	J. Albert et al., Astron. Astrophys. 474 (2007) 937	ASDC/SED tool	Cassiopeia A	MAGIC_2007_CassiopeiaA_SPECTRUM.fits	image/fits	0
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166.1138081	38.2088331	50.0	1000.0	J. Albert et al., ApJ 663 (2007) 125	ASDC/SED tool	Markarian 421	MAGIC_2007_Mrk421_SPECTRUM.fits	image/fits	3
166.1138081	38.2088331	50.0	1000.0	J. Albert et al., ApJ 663 (2007) 125	ASDC/SED tool	Markarian 421	MAGIC_2007_Mrk421_SPECTRUM_1.fits	image/fits	3
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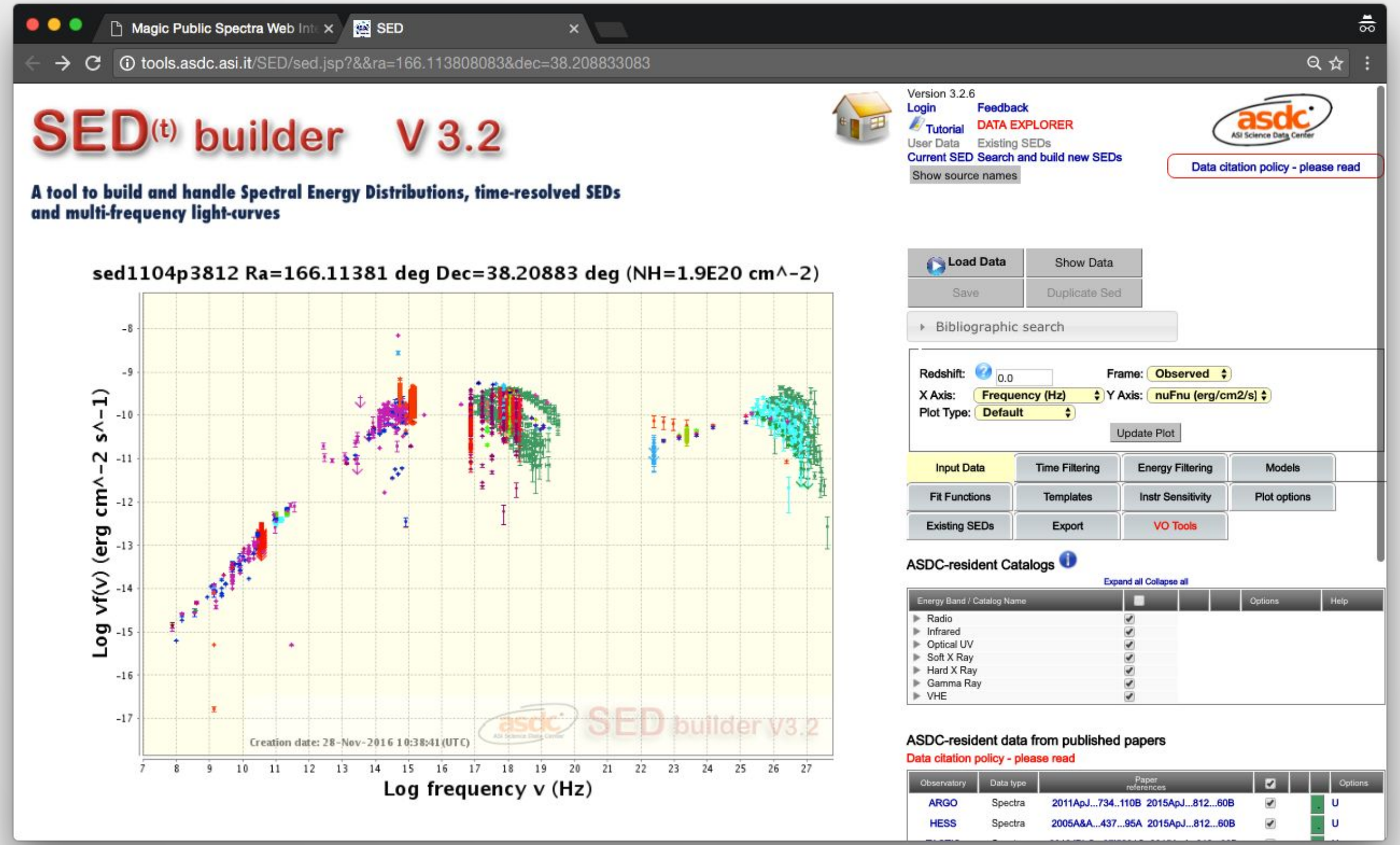
Magic Public Spectra Web Int
SED
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SED(t) builder V 3.2
A tool to build and handle Spectral Energy Distributions, time-resolved SEDs and multi-frequency light-curves
Version 3.2.6
Login
Feedback
Tutorial
DATA EXPLORER
User Data
Existing SEDs
Current SED
Search and build new SEDs
Show source names
asdc
ASI Science Data Center
Data citation policy - please read
sed1104p3812 Ra=166.11381 deg Dec=38.20883 deg (NH=1.9E20 cm^-2)
Log vf(v) (erg cm^-2 s^-1)
Log frequency v (Hz)
Creation date: 28-Nov-2016 10:38:41(UTC)
SED builder V3.2
Load Data
Show Data
Save
Duplicate Sed
Bibliographic search
Redshift:
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Frame:
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X Axis:
Frequency (Hz)
Y Axis:
nuFnu (erg/cm2/s)
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Fit Functions
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Instr Sensitivity
Plot options
Existing SEDs
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Expand all Collapse all
Energy Band / Catalog Name
Options
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Radio
Infrared
Optical UV
Soft X Ray
Hard X Ray
Gamma Ray
VHE
ASDC-resident data from published papers
Data citation policy - please read
Observatory
Data type
Paper references
Options
ARGO
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2015ApJ...812...60B
HESS
Spectra
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2015ApJ...812...60B

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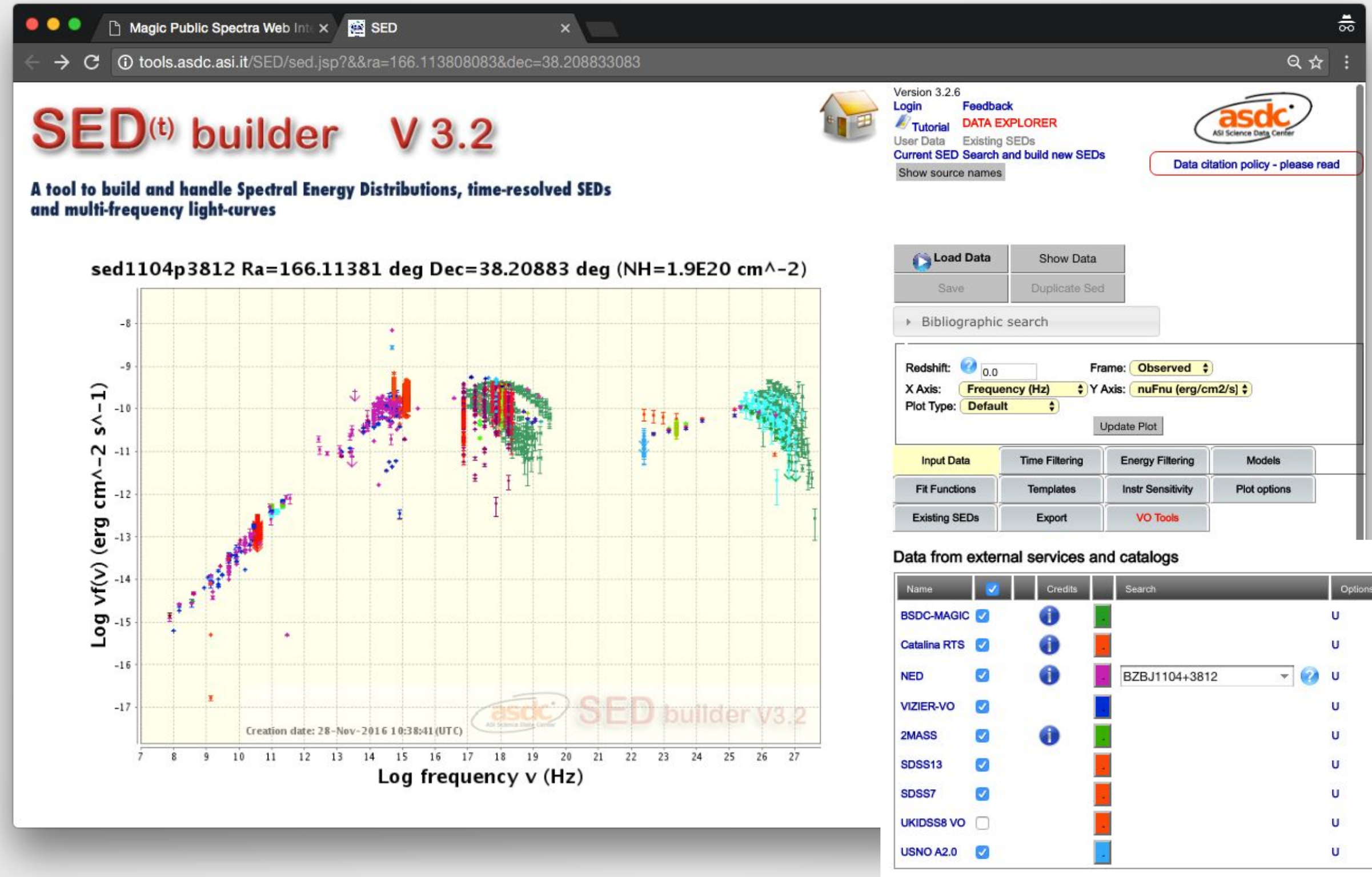
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Models
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Templates
Instr Sensitivity
Plot options
Existing SEDs
Export
VO Tools
Data from external services and catalogs
Name
Credits
Search
Options
BSDC-MAGIC
Catalina RTS
NED
BZBJ1104+3812
VIZIER-VO
2MASS
SDSS13
SDSS7
UKIDSS8 VO
USNO A2.0

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A tool to build and handle Spectral Energy Distributions, time-resolved SEDs and multi-frequency light-curves

Source Data : BSDC-MAGIC (17 entries)

Name	RA(hh mm ss.s)	Dec(dd mm ss.s)	RA(deg)	Dec(deg)	Nufnu (erg cm^-2 s^-1)	Frequency (Hz)	Source Data	Observation Date (MJD)	Reference Link	Ebl Corrected	Warning/Info
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	1.0702E-10+9.7814E-12/-9.7814E-12	3.240E25	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	7.7635E-11+2.7727E-12/-2.7727E-12	5.029E25	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	6.2239E-11+2.4763E-12/-2.4763E-12	7.762E25	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	5.2450E-11+7.5496E-13/-7.5496E-13	1.204E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	3.4482E-11+6.7445E-13/-6.7445E-13	1.862E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	2.0374E-11+6.1465E-13/-6.1465E-13	2.882E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	1.2326E-11+6.5446E-13/-6.5446E-13	4.461E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	3.7637E-12 +/- 0.0000E00	6.906E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	Upper Limit
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	3.4571E-12 +/- 0.0000E00	1.071E27	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	Upper Limit
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	1.0976E-10+1.0152E-11/-1.0152E-11	3.244E25	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	8.7459E-11+3.2280E-12/-3.2280E-12	5.021E25	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	6.8585E-11+2.6875E-12/-2.6875E-12	7.772E25	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	6.2184E-11+2.2390E-12/-2.2390E-12	1.203E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	4.5494E-11+2.3706E-12/-2.3706E-12	1.862E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	2.9685E-11+2.3454E-12/-2.3454E-12	2.882E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	
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Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	6.1046E-12+2.5405E-12/-2.5405E-12	6.860E26	MAGIC	53310.0	J. Albert et al., ApJ 663 (2007) 125	false	

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Source Data : BSDC-MAGIC (17 entries)

	Name	RA(hh mm ss.s)	Dec(dd mm ss.s)	RA(deg)	Dec(deg)	
☑	Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	1.0702
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☑	Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	6.2239
☑	Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	5.2450
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☑	Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	3.4571
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☑	Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	2.9685
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☑	Markarian 421	11 04 27.32	+38 12 31.79	166.11382	38.20883	6.1046

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Astrophysics

Observations of Mkn 421 with the MAGIC Telescope

J. Albert et al. (MAGIC Collaboration)

(Submitted on 17 Mar 2006 (v1), last revised 20 Mar 2007 (this version, v4))

The MAGIC telescope took data of very high energy gamma-ray emission from the blazar Markarian 421 (Mkn 421) between November 2004 and April 2005. We present a combined analysis of data samples recorded under different observational conditions, down to gamma-ray energies of 100 GeV. The flux was found to vary between 0.5 -- 2 Crab units (integrated above 200 GeV), considered a low state when compared to known data. Although the flux varied on a day-by-day basis, no short-term variability was observed, although there is some indication that not all nights are in an equally quiescent state. The results at higher energies were found to be consistent with previous observations. A clear correlation is observed between gamma-rays and X-rays fluxes, whereas no significant correlation between gamma-rays and optical data is seen. The spectral energy distribution between 100 GeV and 3 TeV shows a clear deviation from a power law, more clearly and at lower flux than previous observations at higher energies. The deviation persists after correcting for the effect of attenuation by the extragalactic background light, and most likely is source-inherent. There is a rather clear indication of an inverse Compton peak around 100 GeV. The spectral energy distribution of Mkn 421 can be fitted by a one-zone synchrotron self-compton model suggesting once again a leptonic origin of the very high energy gamma-ray emission from this blazar.

Comments: ApJ accepted, 14 pages, 16 figures, 4 tables. updated figures 10, 11, and 12 and one reference
Subjects: **Astrophysics (astro-ph)**
Journal reference: Astrophys.J.663:125-138,2007
DOI: 10.1086/518221
Report number: MPP-2006-29
Cite as: **arXiv:astro-ph/0603478**
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Submission history

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References & Citations
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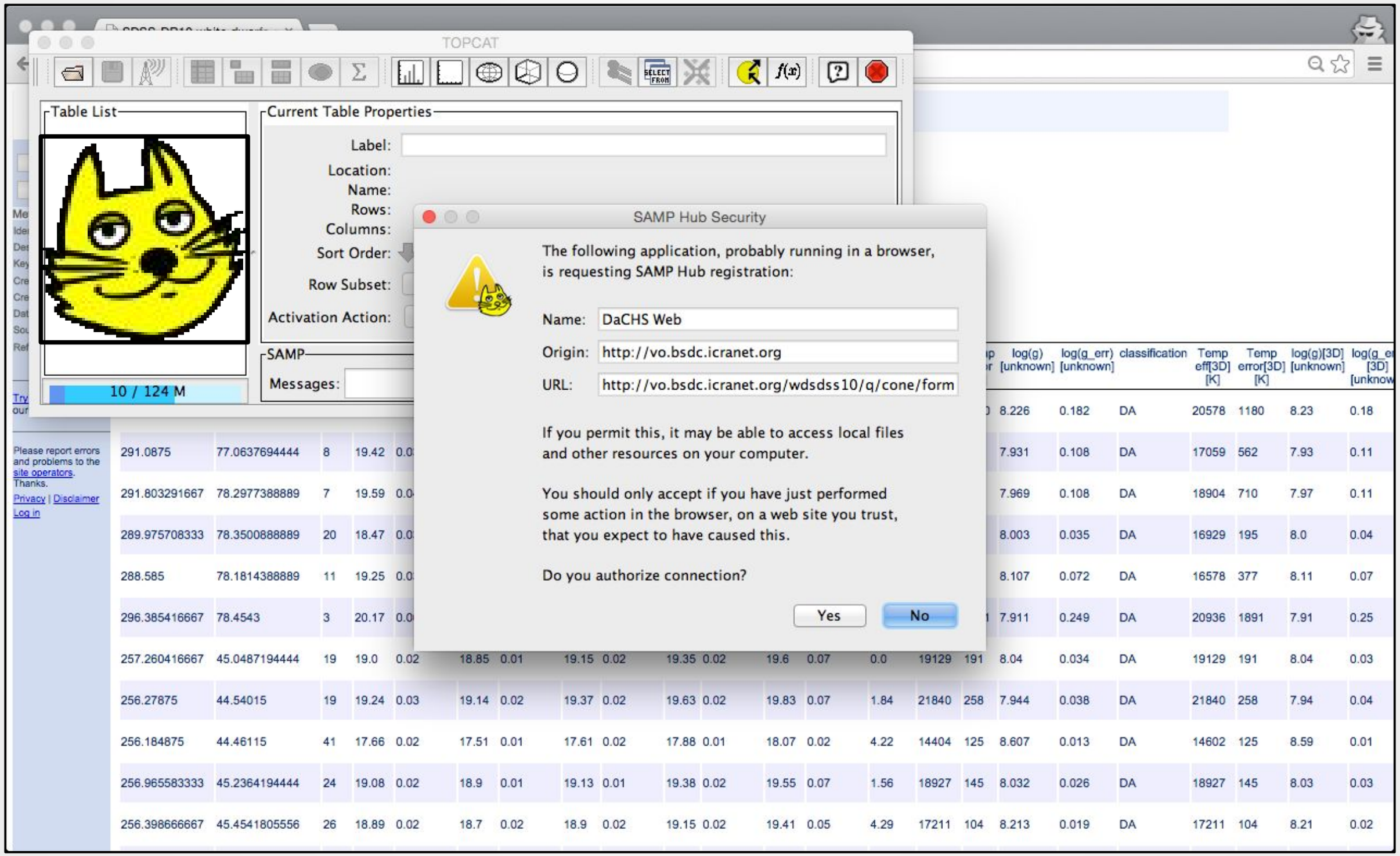
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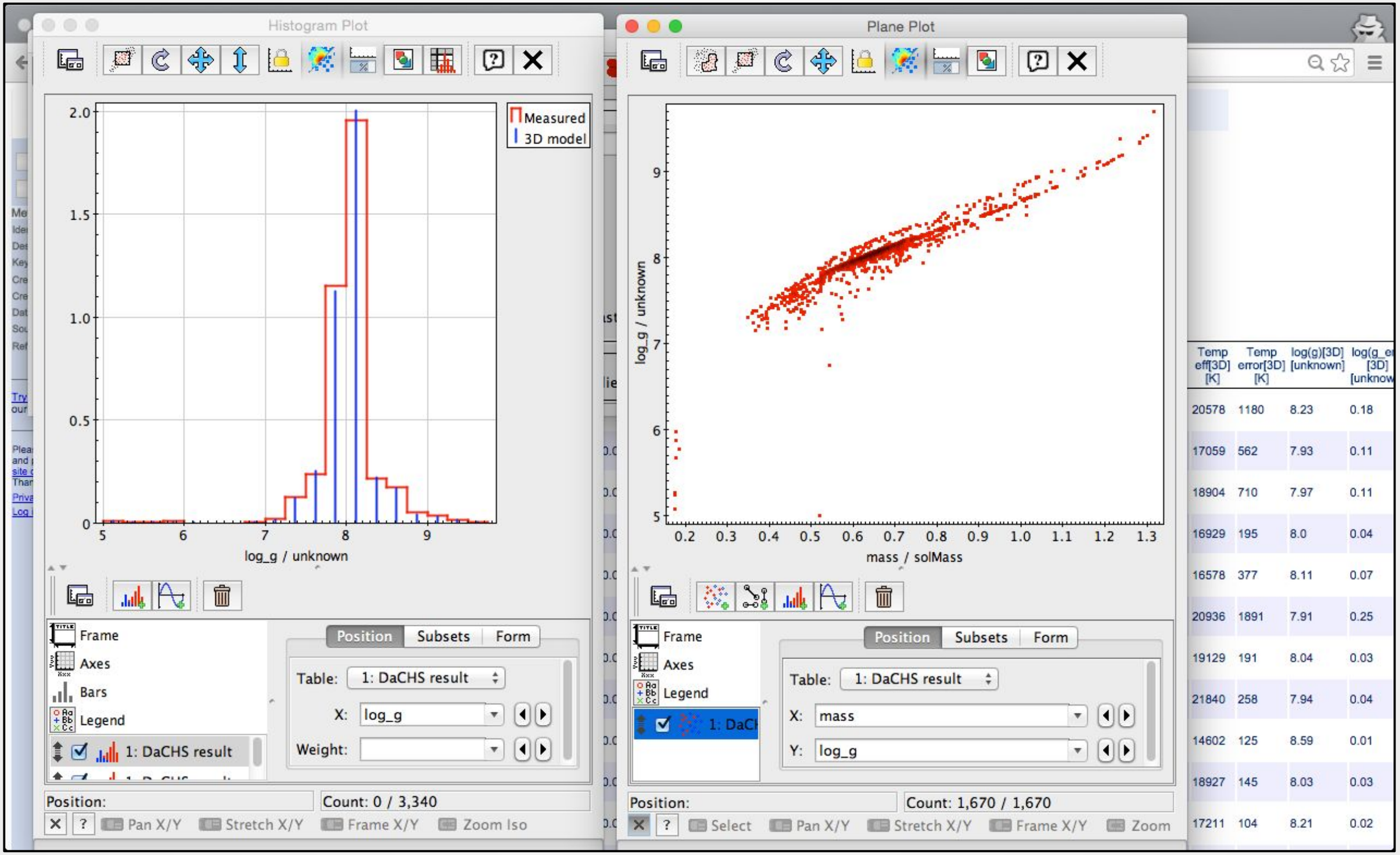
Rows:
Columns:
Sort Order:
Row Subset:
Activation Action:
SAMP
Messages:
10 / 124 M
SAMP Hub Security
The following application, probably running in a browser, is requesting SAMP Hub registration:
Name: DaCHS Web
Origin: http://vo.bsdc.icranet.org
URL: http://vo.bsdc.icranet.org/wdsdss10/q/cone/form
If you permit this, it may be able to access local files and other resources on your computer.
You should only accept if you have just performed some action in the browser, on a web site you trust, that you expect to have caused this.
Do you authorize connection?
Yes
No
Please report errors and problems to the site operators. Thanks.
Privacy | Disclaimer
Log in

BSDC-*VO*-ASDC


Histogram Plot
Measured
3D model
log_g / unknown
Frame
Axes
Bars
Legend
1: DaCHS result
Position
Subsets
Form
Table: 1: DaCHS result
X: log_g
Weight:
Position:
Count: 0 / 3,340
Pan X/Y
Stretch X/Y
Frame X/Y
Zoom Iso
Plane Plot
log_g / unknown
mass / solMass
Frame
Axes
Legend
1: DaCH
Position
Subsets
Form
Table: 1: DaCHS result
X: mass
Y: log_g
Position:
Count: 1,670 / 1,670
Select
Pan X/Y
Stretch X/Y
Frame X/Y
Zoom
Temp eff[3D] [K]
Temp error[3D] [K]
log(g)[3D] [unknown]
20578 1180 8.23 0.18
17059 562 7.93 0.11
18904 710 7.97 0.11
16929 195 8.0 0.04
16578 377 8.11 0.07
20936 1891 7.91 0.25
19129 191 8.04 0.03
21840 258 7.94 0.04
14602 125 8.59 0.01
18927 145 8.03 0.03
17211 104 8.21 0.02

Concluding remarks

VO is mature. It works.
We now have to make it simple.
To raise data usability

Metadata, a big deal can be done from both sides:
data publishers properly using and expanding VO semantics and data consumers profiting from that

*Possible data/metadata evaluator to fill the gaps

Merge efforts, focus on products and outreach