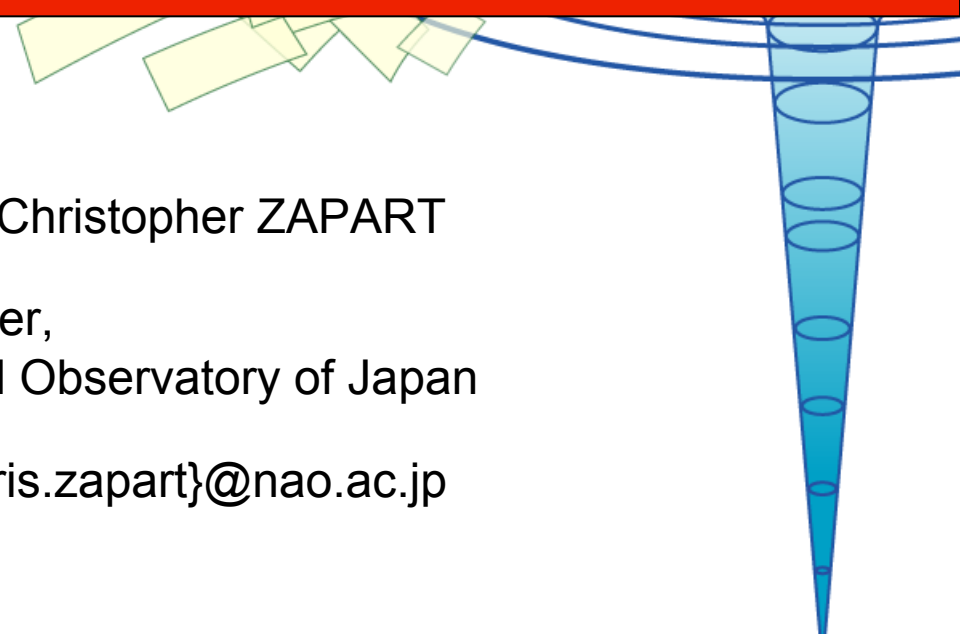# ALMA FITS Archive in JVO

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The Primary Developer

Christopher Zapart

A research fellow working in the JVO project.

Collaborating with:

Chile obs. -- Kosugi, Kobayashi, et al.

JVO – Shirasaki, Mizumoto, Ohishi

ALMA FITS Archive (1)

- Released in March, 2016
- Features:
  - an interactive preview of ALMA FITS files
    the only FITS quick-look service among ALMA archival services in the world
  - Server and Personal editions
    - Identical functionalities
  - real-time image zooming

ALMA FITS Archive (2)

- Features:
  - Coordinate grid, synthesized beam, contours
  - real-time frequency spectrum updates
    - sky frequency → rest frequency
    - Line identification (link with Splatalogue)
    - Radial velocity
  - partial FITS downloads

JVO portal

http://jvo.nao.ac.jp/portal/

Ver.2 | Top | Search | VOServices | Subaru | ALMA | JVOSpace → Login

p00 ver.171019   News

I am a guest

Service Contents   Help(J)

News

- VO Search update: new VO search interface named JVOIndex and JVOExplorer are open to the public. (2017-03-08)
- Subaru WebQL experimental version is available at data download page of JVO Suprime-Cam mosaic image archive. Try it with a sample image (2017-03-08)
- ALMA WebQL v2 was updated. (2016-10-15)
- Gaia source catalog is now availabe at JVO portal. (2016-10-15)
- Subaru Suprime-Cam Archive was updated. All the data were reprocessed with the most recent data reduction pipeline. (2016-04-10)
- ALMA WebQL v2 (trial version) is now available. Try it on several sample data ! (2016-03-09)

Data Search

- Quick Search
- Single VO Service
- Multiple VO Services
- JVO Sky
- JVOQL Search

Subaru

- Suprime-Cam
- HDS
- MOIRCS

ALMA

- ALMA SV FITS Data
- ALMA FITS Archive
- ALMA WebQLv2 Demo

Surveys

- Subaru Deep Survey

Service Search

- Keyword Search
- JVOIndex
- JVOExplorer
- Advanced Search

JVO Space

- Home
- Work

Astro Tools

- Source Extractor
- HyperZ

Bookmark

- Bookmark of VOService
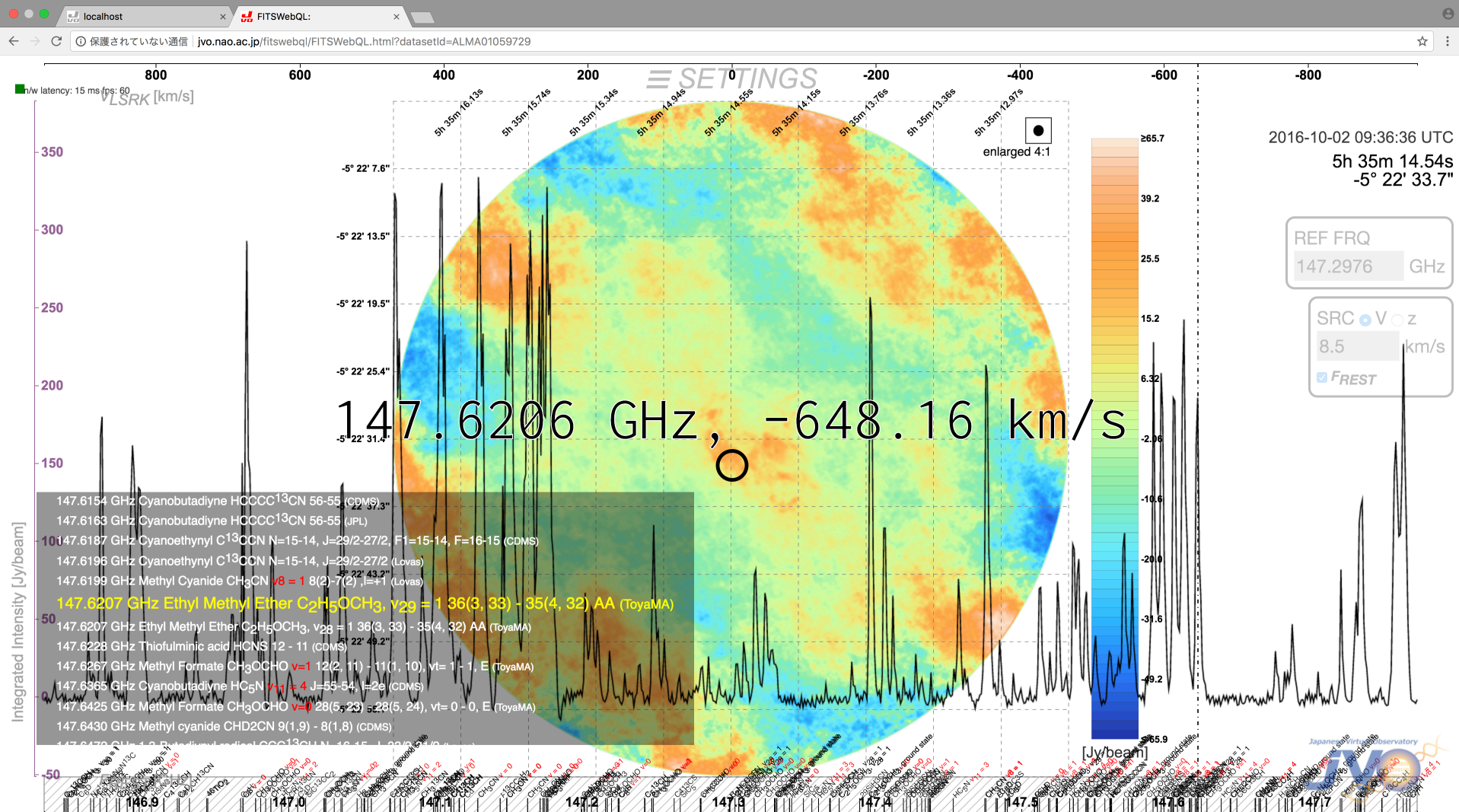- Bookmark of JVOSpace

1159 project data are in public, as of today

Target Name	Simbad Name	**Project Code**	Coords	Frequency	Advanced	Desktop Viewer

Numbre of Projects found : 1159   Clear all the filters

#	Project Code	# of Data	Title	Category	Last Upate
1	2015.1.01207.S	76	Diagnozing Protoplanet Formation in Protoplanetary Disks	Disks and planet formation	2017-12-25
2	2015.1.01287.S	90	Particle growth in disks across the substellar limit	Disks and planet formation	2017-12-25
3	2016.1.00133.T	989	An ACA N+ survey of z=3-7 DSFGs from the South Pole Telescope survey	Galaxy evolution	2017-12-25
4	2016.1.00386.S	8	Molecular Clouds and Star Formation: Across M83		2017-12-25
5	2016.1.00282.S	42	CH+ lines in starburst galaxies at redshift z=2~4: probes of massive turbulent gas reservoirs		2017-12-25
6	2015.1.00102.S	170	Warm and Dense Molecular Gas in Local Merging ULIRGs	Galaxy evolution	2017-12-23
7	2015.1.01362.S	9	ALMA Imaging of the Star Formation Process at its Historic Peak	Galaxy evolution	2017-12-20
8	2015.1.00167.S	163	Spatially resolved wideband spectroscopy in ULIRGS obscured nuclei II	Galaxy evolution	2017-12-20
9	2015.1.00754.S	70	Zooming in on the AGN-driven star formation in distant, powerful, radio-loud AGN	Active galaxies	2017-12-20
10	2015.1.00888.S	54	Probing disk structure in a cavity of pre-transitional disks around Sun-like young stars	Disks and planet formation	2017-12-20
11	2016.1.00875.S	68	Formation, State, and Structure of all Major CMZ Clouds	ISM and star formation	2017-12-20
12	2015.1.00206.S	48	Unravelling the enigmatic mass loss of Betelgeuse	Stars and stellar evolution	2017-12-20
13	2016.1.00565.S	52	Characterizing the Gas Surface Density and CO abundance Structure in Disks with Known Gas Masses	Disks and planet formation	2017-12-20
14	2016.1.01019.S	54	Tracing the Origins of Nitrogen Bearing Organics Toward Orion KL	ISM and star formation	2017-12-20
15	2015.1.00481.S	134	Circumnuclear molecular disks in early-type galaxies as a probe of black hole masses: Expanding the sample	Active galaxies	2017-12-20
16	2016.1.01481.S	620	Measuring the Spectral Evolution, Structure, and Speed of Extragalactic Jets with ALMA	Active galaxies	2017-12-20
17	2015.1.00804.S	88	The Galaxy Merger Process: Molecular Gas Properties at the Beginning and the End	Active galaxies	2017-12-20
18	2016.1.00434.S	104	Unlocking our understanding of submm galaxies with ALMA identifications for >1000 SMGs	Active galaxies	2017-12-20
19	2016.1.00231.S	66	Imaging the most distant and extreme starbursts in the Universe	Active galaxies	2017-12-20
20	2015.1.01060.S	112	Identification of the Centrifugal Barrier of the Infalling Rotating Envelope in the Hot Corino Source IRAS 16293?2422	ISM and star formation	2017-12-20
21	2015.1.00960.S	196	SiO Megamasers in AGN Accretion Disks	Active galaxies	2017-12-20
22	2015.1.00199.S	35	Proving the AGN feedback in the extremely IR-bright Dust Obscured Galaxies	Active galaxies	2017-12-19
23	2015.1.00404.S	105	Gas fueling and outflow around massive black holes	Active galaxies	2017-12-19
24	2015.1.00504.S	759	A search for the most distant and extreme starbursts in the Universe	Galaxy evolution	2017-12-19
25	2015.1.00393.S	4	CI observations toward compact molecular clouds associated with isolated intermediate- and high-mass YSOs in the LMC	ISM and star formation	2017-12-15
26	2016.1.00117.S	34	FIR [O III] emission from a z ~ 8 candidate galaxy: A glimpse into early production of heavy elements	Galaxy evolution	2017-12-15
27	2015.1.00279.S	46	Triplets of Quasars: Exploring the Origin of Clusters with ALMA	Active galaxies	2017-12-15
28	2015.1.01528.S	376	AS2UDS: Cluster of ~1000 ALMA-identified submillimeter galaxies	Active galaxies	2017-12-15
29	2015.1.01320.S	23	Dissecting starbursts at z=3.6 through multi-line H2O imaging	Active galaxies	2017-12-15
30	2015.1.01012.S	38	Disentangling the molecular gas content in gas-rich galaxies at z ~ 0.15	Galaxy evolution	2017-12-15
31	2015.1.01539.S	474	constraining models of high-mass star formation	ISM and star formation	2017-12-15
32	2015.1.00449.S	91	Fragmentation of massive dense clumps	ISM and star formation	2017-12-15
33	2015.1.00902.S	95	Kinetic temperature measurement within galaxies	Galaxy evolution	2017-12-15

79 GB FITS file !

保護されていない通信 | jvo.nao.ac.jp/fitswebql/FITSWebQL.html?datasetId=ALMA01059729

n/w latency: 15 ms fps: 60

v_{LSRK} [km/s]

≡ SETTINGS

5h 35m 16.13s   5h 35m 15.74s   5h 35m 15.34s   5h 35m 14.94s   5h 35m 14.55s   5h 35m 14.15s   5h 35m 13.76s   5h 35m 13.36s   5h 35m 12.97s

enlarged 4:1

2016-10-02 09:36:36 UTC
5h 35m 14.54s
-5° 22' 33.7"

REF FRQ
147.2976 GHz

SRC ○ V ○ z
8.5 km/s
☑ F_{REST}

147.6206 GHz, -648.16 km/s

Integrated Intensity [Jy/beam]

147.6154 GHz Cyanobutadiyne HCCCC^{13}CN 56-55 (CDMS)
147.6163 GHz Cyanobutadiyne HCCCC^{13}CN 56-55 (JPL)
147.6187 GHz Cyanoethynyl C^{13}CCN N=15-14, J=29/2-27/2, F1=15-14, F=16-15 (CDMS)
147.6196 GHz Cyanoethynyl C^{13}CCN N=15-14, J=29/2-27/2 (Lovas)
147.6199 GHz Methyl Cyanide CH$_3$CN $v8 = 1$ 8(2)-7(2),l=+1 (Lovas)
147.6207 GHz Ethyl Methyl Ether C$_2$H$_5$OCH$_3$, $v_{29} = 1$ 36(3, 33) - 35(4, 32) AA (ToyaMA)
147.6207 GHz Ethyl Methyl Ether C$_2$H$_5$OCH$_3$, $v_{28} = 1$ 36(3, 33) - 35(4, 32) AA (ToyaMA)
147.6228 GHz Thiofulminic acid HCNS 12 - 11 (CDMS)
147.6267 GHz Methyl Formate CH$_3$OCHO $v=1$ 12(2, 11) - 11(1, 10), vt= 1 - 1, E (ToyaMA)
147.6365 GHz Cyanobutadiyne HC$_5$N $v_{11} = 4$ J=55-54, l=2e (CDMS)
147.6425 GHz Methyl Formate CH$_3$OCHO $v=0$ 28(5, 23) - 28(5, 24), vt= 0 - 0, E (ToyaMA)
147.6430 GHz Methyl cyanide CHD2CN 9(1,9) - 8(1,8) (CDMS)

[Jy/beam]

≥65.7
39.2
25.5
15.2
6.32
-2.06
-10.6
-20.0
-31.6
-49.2
-65.9

146.9   147.0   147.1   147.2   147.3   147.4   147.5   147.6   147.7

(Part of) Technologies used

- custom multi-threaded reading of FITS files from SSD into RAM (cfitsio library too slow with 10GB+ FITS)

- on-the-fly ENDIAN and FLOAT32 to FLOAT16 (half-float) conversion while reading FITS

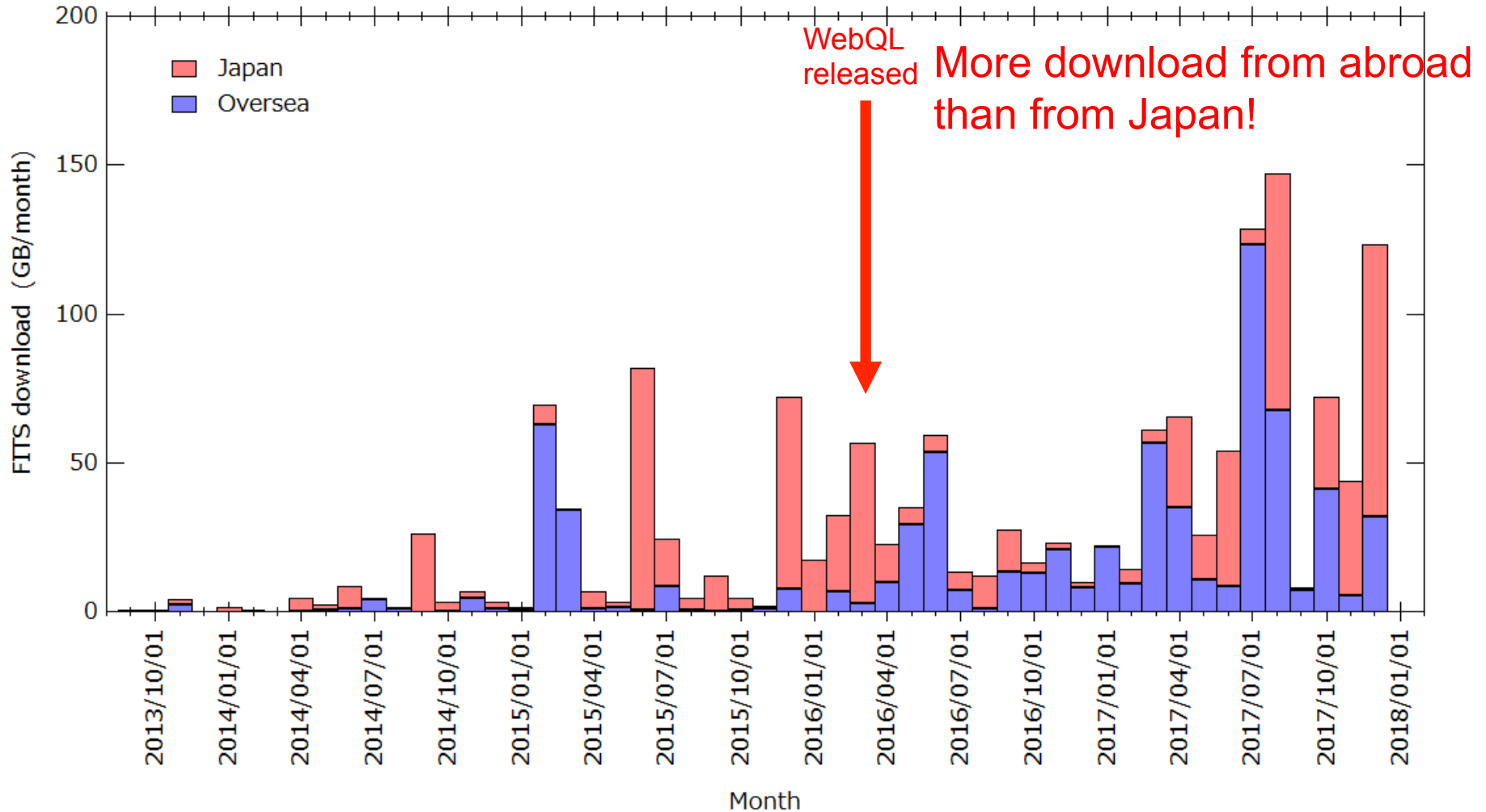- FITS files mmapped to Linux kernel user space memory instead of read()/write() calls
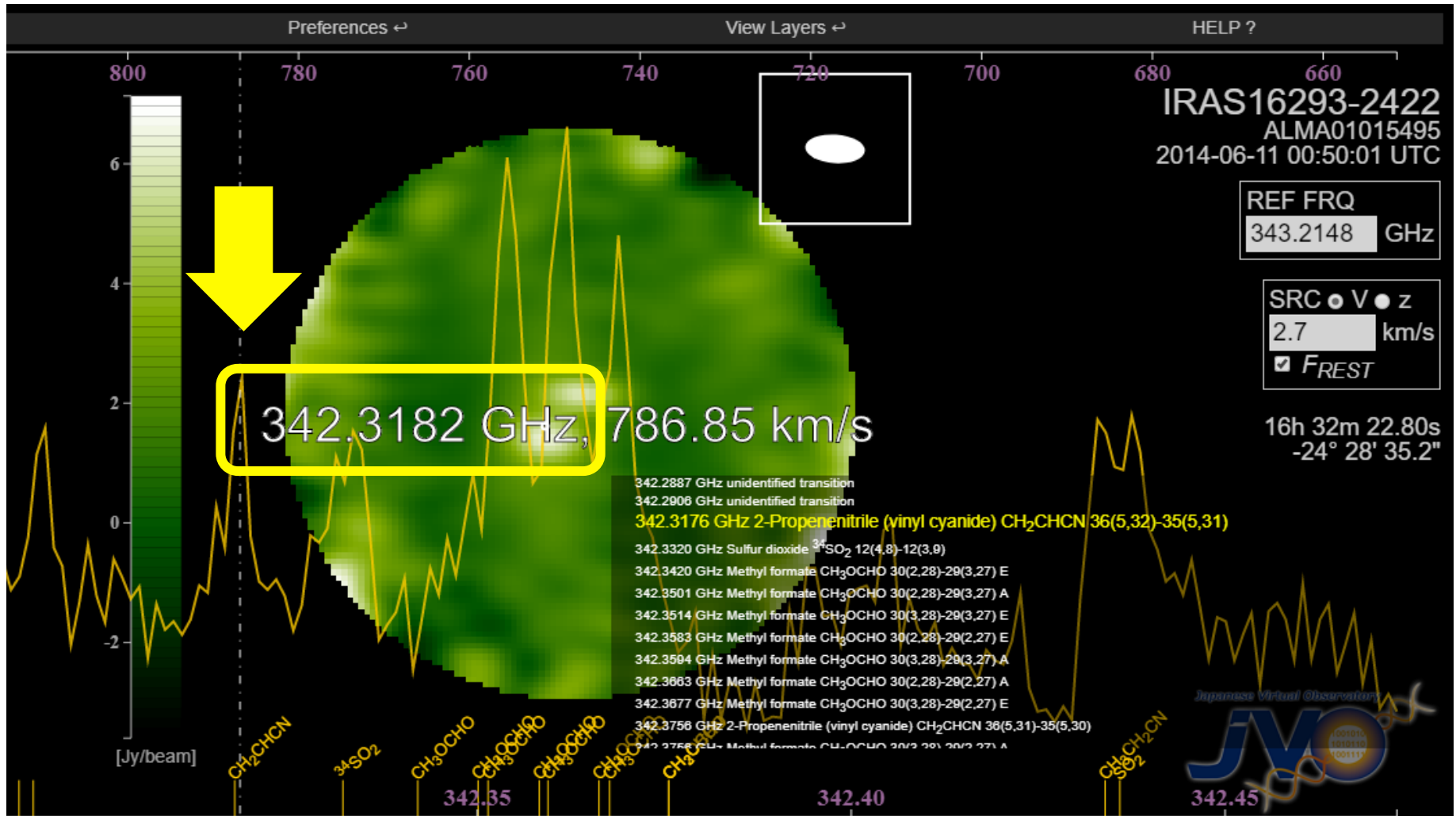
- others

Access to JVO/ALMA page
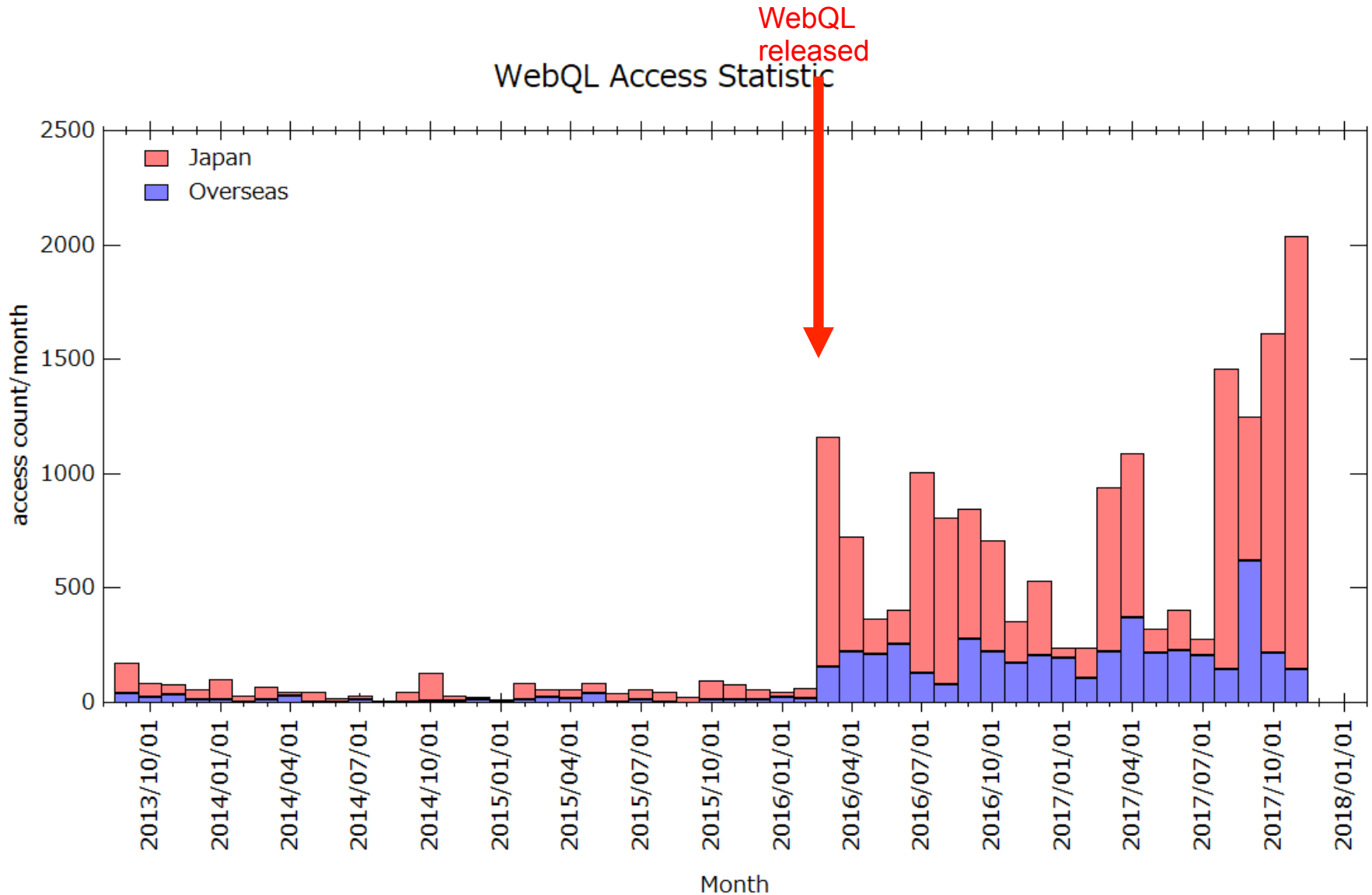
Access to JVO/ALMA page

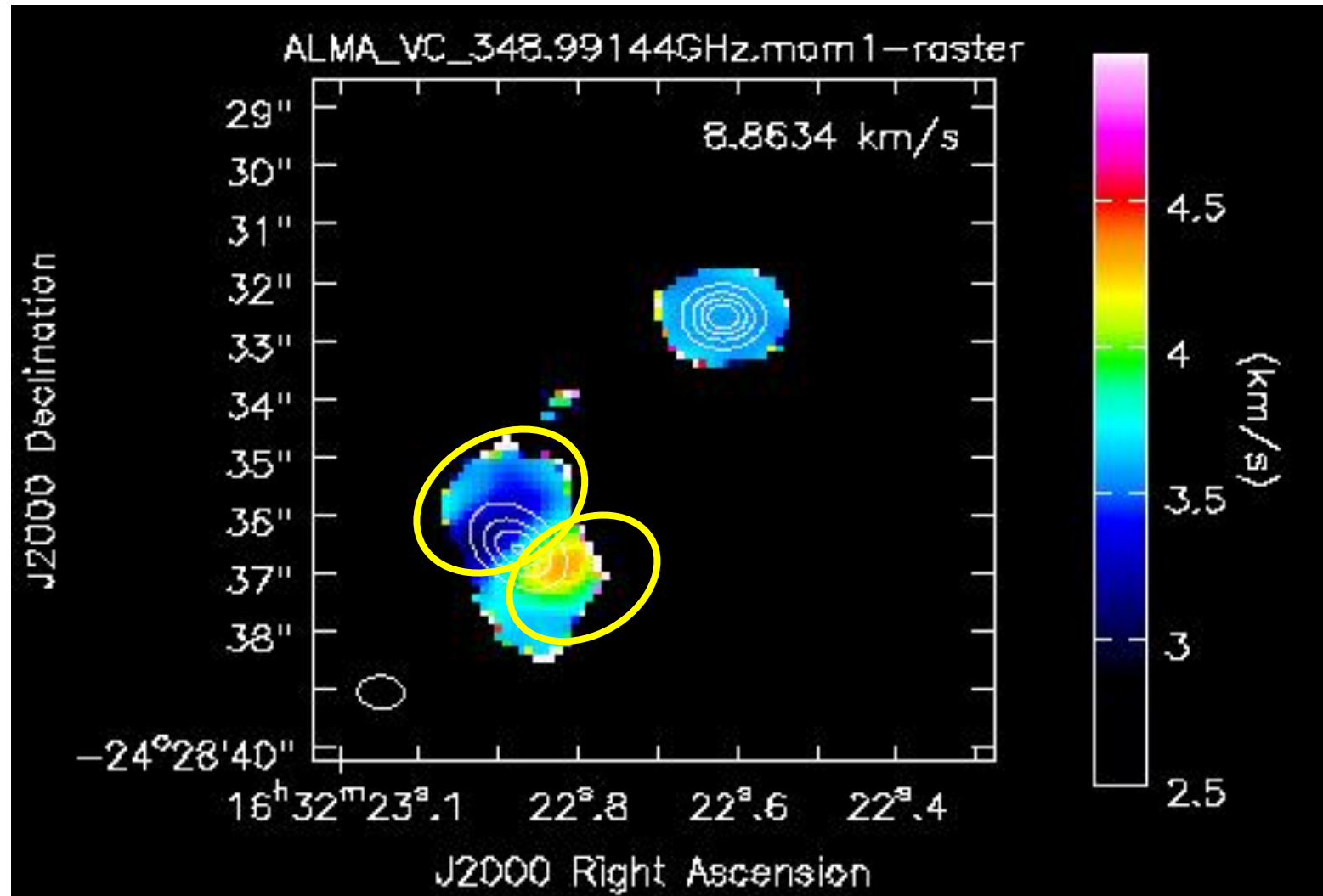ALMA FITS Archive Statistics : data download (size)

WebQL released

More download from abroad than from Japan!

Detection of CH₂CHCN in IRAS16293-2422

Succeeded by an undergraduate student !

Vinyl Cyanide from the rotating disk

Examples of referred papers published

- "High-resolution ALMA observation of the 12CO(3-2) and 350 GHz continuum emissions of the debris disc of 49 Ceti", Nhung, P.T. et al., MNRAS, 469, 4726-4739, August 2017

- "The varying mass distribution of molecular clouds across M83", Freeman et al., MNRAS, 468, 1769-1781, June 2017

- "On the dust and gas components of the z = 2.8 gravitationally lensed quasar host RX J0911.4+0551" Tuan-Anh, P. et al., MNRAS, 467, 3513-3524, May 2017

- "Class II 6.7 GHz Methanol Maser Association with Young Massive Cores Revealed by " Chibueze, J.O et al., ApJ, 836, id. 59, February 2017

- More to come

One important request to users

When you publish papers, please add the acknowledgements as follows:

"This paper makes use of the following ALMA data: ADS/JAO.ALMA#<Project code>. ALMA is a partnership of ESO (representing its member states), NSF (USA) and NINS (Japan), together with NRC (Canada) , NSC and ASIAA (Taiwan), and KASI (Republic of Korea), in cooperation with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ."

and

"[Part of] the data are retrieved from the JVO portal (http://jvo.nao.ac.jp/portal) operated by the NAOJ"