Science Priorities

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IVOA Committee for Science Priorities

CoSADIE Project

IVOA level

- Gathered from Astro community via national projects *(in Europe via Euro-VO SAC and Science teams, and VO School feedback)*
- current and past priority areas:
  - *Time Series*
  - *Multi-dimensional Data (Radio/mm/IFU/simulation...)*
  - *Spectral Energy Distributions*
  - *Query by object classification and lists*
  - *Query via core observational parameters*

Current Science Priorities

Multi-dimensional Data

Radio astronomy, Integral Field Spectroscopy, high energy, polarization, simulation, data mining datasets + ...

Time Domain Astronomy

Time Series, light curves, transient event reports, +...

- Need to ensure that these are accessible and useable within the VO

Engagement with data producers

- IVOA Focus Sessions (Heidelberg 2013) engaged projects and surveys that produce and use multi-d and time domain data
- Invited presentations / Panel Discussions
- Part of IVOA process - requirements, use cases, feedback from implementation. Follow-up technical WG sessions.

Tuesday May 14 2013				
5	09:00–09:10	gHS	Focus session on multi-dimensional data - Introduction	Mark Allen (Session Chair)
	09:10–09:30	gHS	CyberSKA	Russ Taylor
	09:30–09:50	gHS	ALMA, JVLA, VLBA	Brian Glendenning
	09:50–10:10	gHS	CALIFA	Mariya Lyubenova
	10:10–10:30	gHS	MUSE	Thomas Martinsson
Wednesday May 15 2013				
9	09:00–09:10	gHS	Focus session on time domain astronomy - Introduction	Enrique Solano (Session Chair)
	09:10–09:30	gHS	CoRoT, Kepler time series	Jonas Debosscher
	09:30–09:50	gHS	Designs and Requirements for Time Domain Data in LSST	Mario Juric (LSST)
	09:50–10:10	gHS	ASKAP/VAST	Paul Hancock
	10:10–10:30	gHS	LOFAR Transients	John Swinbank
	10:30–11:00	***Break***		

Goals/Results of Focus Sessions

- Summarize data being produced now ✓
- Identify the metadata needed to discover, access, analyse these data ✓
- Status of VO standards in these areas ✓
- Identify implementation hurdles ✓
- Identify desirable features in standards, services, tools ✓

VO already in use/plans

- ALMA - using OpenCADC TAP, voview, will use SAMP, ObsCore, SIAPv2
- CyberSKA - VO access option via CADC
- CALIFA - data access via TAP and SSA
- MUSE - VO publishing via AstroWise
- ASKAP - all data through VO protocols
- CoRoT - avail from SVO, Kepler - avail from MAST
- LOFAR - VOEvent broker

- Identify the metadata needed to discover, access, analyse these data

Radio - commonly 4-6D RA, Dec, freq/vel, pol, (time)

Event lists: Time stamp, (x,y) -> (ra,dec), energy (freq, wave)

IFU - 3D: ra, dec, wave

Polarization + auxillary data/models

IFU footprints - fibre size/pos/filling

PSF

Calibration, quality flags

Time

period

Data count statistics

ephemeris - position

spectral type, classification

+ ...

Multi-d → negotiated minimal requirements for Data Cube Access

- Being pursued by projects. *(VAO, Euro-VO [CDS])*
- *(Japan VO access to ALMA cubes)*
- Demonstrations expected at Hawaii interop

- 1. Data Discovery (Query)

I need to be able query a data collection in the following manner:
Give me a list of all observations that constraints:

i. Select on RA,DEC
ii. Select on Frequency/wavelength
iii. Select on whether polarization measurements exist
iv. Select on the spatial size of the observation
v. Select on angular resolution
vi. Select on Integration time
vii. Select on Time of observation

This set of constraints returns a list of observations that satisfy the constraints.

2. Data Access

Once I have the list of observations that satisfy the constraints I examine it and I want to download subsets of the data:

i. Download all datasets in the returned table
ii. Manually select a subset of data to download

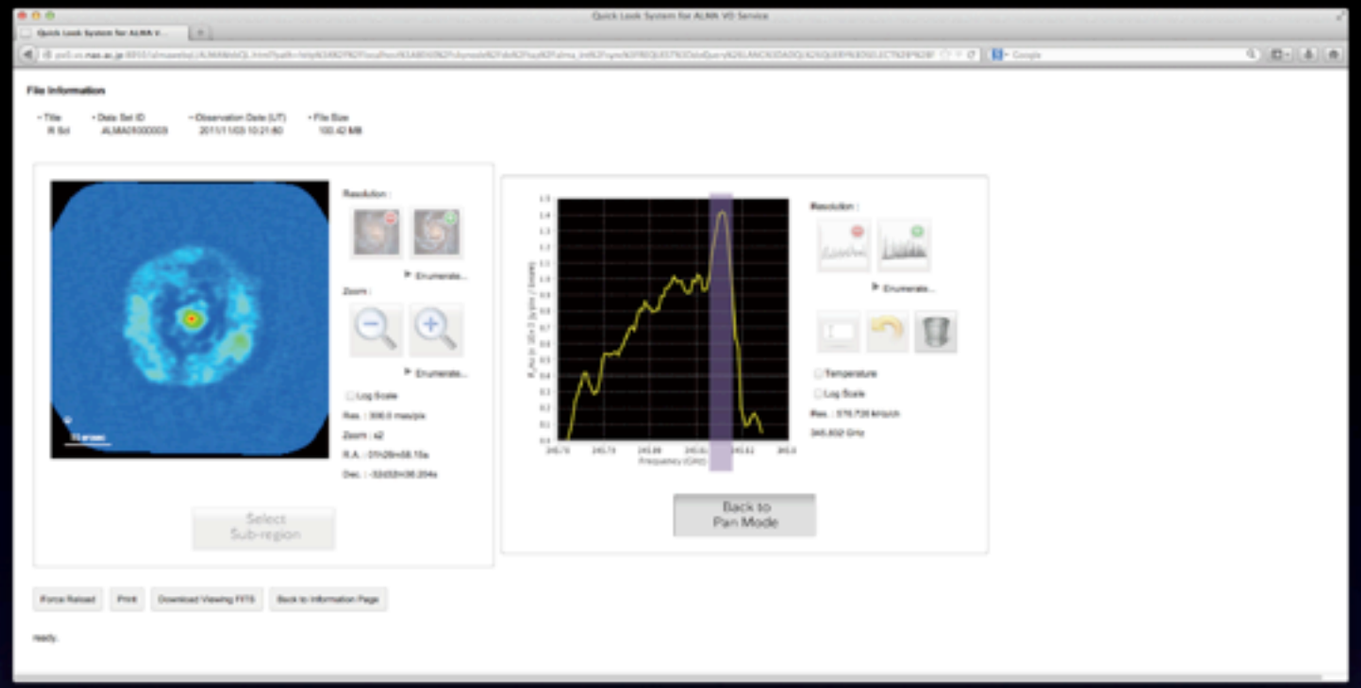
iii. ***** above represent the MINIMAL requirements

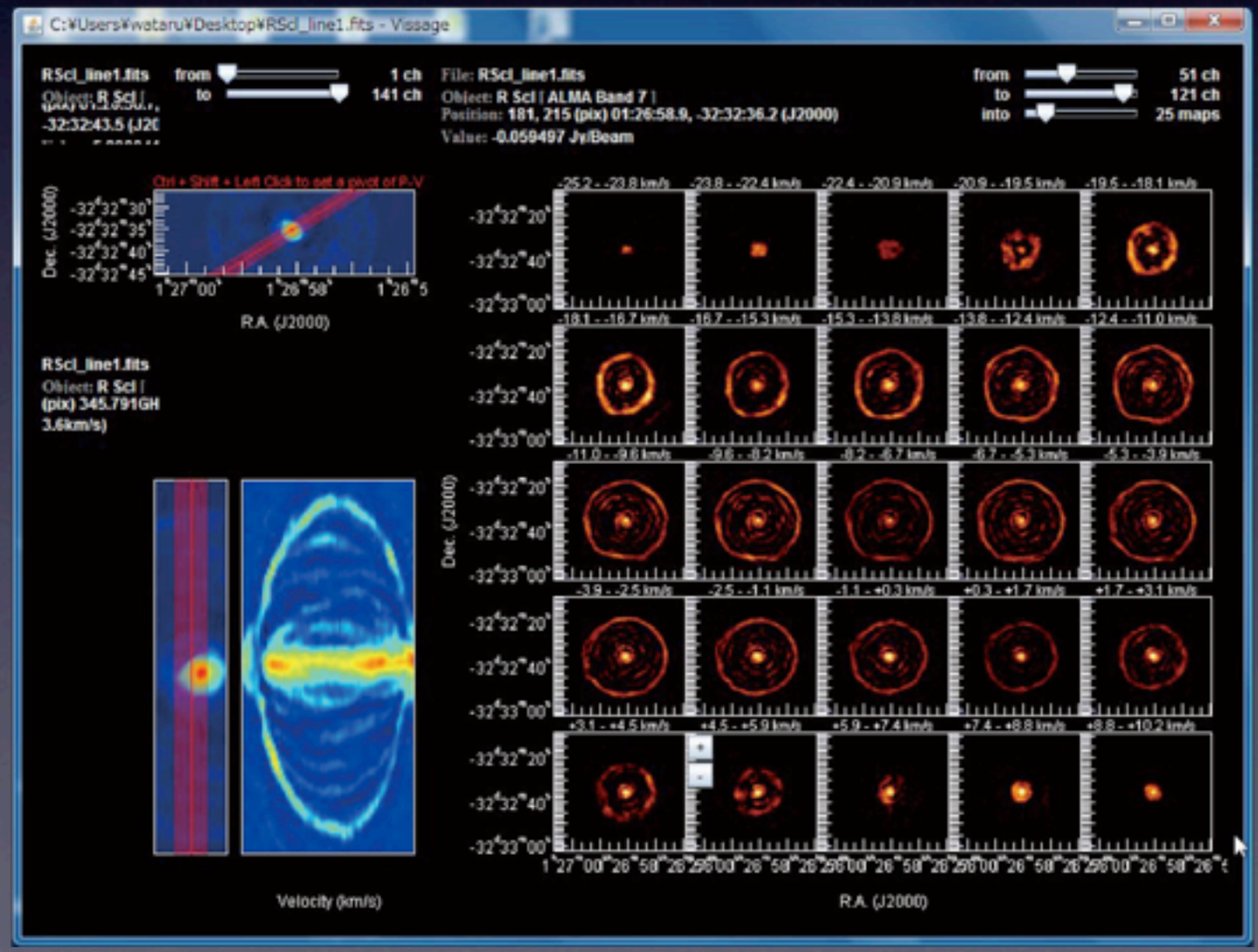
iv. ***** below are desirable features: they should be added to and prioritized
v. Cutouts of subsets in any dimension of the data
vi. Sum along any one or more axes
vii. Re-bin in one or more axies
viii. Multiply by a function

VAO - ?

CDS

JVO
(demo?)





Time Domain ➔

need to discuss near term goals

- Time Domain Interest Group
- *Engagement with time domain community e.g. via Transient Universe meeting (Nov 2013)*
- *Need to discuss minimal requirements for Time Series Access*

Euro-VO Science

- Good, but affected by reduced effort
- Spanish community has high rate of publishing 'VO' papers
- VO School successful, some tutorials renewed but more updates needed
- Importance recognized via ASTRONET infrastructure roadmap, but maintaining visibility important