CASSIS

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on behalf of the CASSIS team

Outline:

• CASSIS in a nutshell
• Interoperability in CASSIS
• Technical information

CASSIS

Centre d’Analyse Scientifique de Spectres Instrumentaux et Synthétiques

http://cassis.irap.omp.eu

• Free spectrum analysis software developed at IRAP since 2005
• Projects scientists: E. Caux (PI), S. Bottinelli, C. Vastel
• Developers: J.-M. Glorian (Project manager), M. Boiziot, D. Rabois
• Developed in Java
• Features: line identification (large datasets), synthetic spectra, scripting (Jython)
• Interoperability: HIPE (Herschel software) plug-in, SAMP, SSAP, VAMDC

http://cassis.irap.omp.eu
Why CASSIS?

- Display spectra, *WHATEVER* their x- and y-axis units
- Manipulate and analyse
  - Re-sampling, average, operations, ...
  - Line identification, best model ($\chi^2$)
Why CASSIS?

- Line identification: CASSIS especially useful when dealing with large datasets (more and more frequent with the increase in bandwidth and spectral resolution of recent receivers).

Show all transitions of CO potentially present in this spectrum.
Why CASSIS?

- Show a mosaic of all CS transitions, overlaid with an LTE model and positions of other species.

Key point: CASSIS needs a spectroscopic database.

http://cassis.irap.omp.eu
Databases and interoperability

- Our needs: molecular, atomic and collisional databases
- Local database: SQLite database (downloaded with CASSIS stand-alone) built from on-line databases (CDMS, JPL, NIST, etc: ascii files) and from contributed databases
- VAMDC (atomic and molecular database with collisional coefficients):
  - default with CASSIS online release
  - only CDMS or JPL at the moment
  - VAMDC protocol:
    → fully meets our needs: includes all needed keywords and collisional databases
    → makes use of IVOA concepts/philosophy
- Can easily switch between VAMDC and local database
Spectra and interoperability

CASSIS now includes a module for SSA queries!
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Upon selection, CASSIS returns a list of unavailable services (at a given moment), and the reason why.
Spectra and interoperability

CASSIS now includes a module for SSA queries!

1. Enter object name
2. Click (will return coordinates)
3. Click to query all selected services
4. Results are returned in a separate tab for each service
5. Services that did not yield any results are automatically deselected

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Spectra and interoperability

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To display with spectrum analysis (overview of full spectrum)
Spectra and interoperability

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To choose how to display the spectrum, e.g. with Line Analysis.
Spectra and interoperability

CASSIS now includes a module for SSA queries!
Spectra and interoperability

CASSIS now includes a module for SSA queries!
1. Update of registries needed: too many services are constantly unavailable.

2. Problem with validation/compliance of protocol: we had to implement several exceptions to be able to retrieve/display data from certain services.
   - For example, in the same service, have x-axis in ‘um’ or in ‘microns’?!? → unify and impose?
   - Some fits files are not "self-contained"

3. Evolution of registry: implement filter for services based on, e.g., keyword, wavelength? how to make this standard?
Tools for the development

Platform of development:

• Version Control Systems:
  SVN → GIT: use Gitlab to manage the repository

• Test:
  Unit test: Junit
  Graphic test: Fest

• Continuous integration:
  Jenkins

• Metrics and Control quality:
  SONAR

• Build systems:
  ANT → Maven
Future plans ...

- Divide CASSIS into independent modules and provided them separately
  - Jython, Database Access
  - Line Analysis, Synthetic model
  - ...
- Already doable for SSA Module:
  - developed independently of CASSIS
  - only two external libraries: regclient (M. Taylor) and ivoaregistry (R. Plante)
- Open the access to a part of the platform
  - Maven and Git repositories
  - Jenkins and sonar reporting
Collaborations

Several collaborations:

- CASSIS is now part of the applications available in Specflow (project part of OV-GSO)  

- CASSIS will be included in the next version of AppLauncher (provided by JMMC)

- On-going: use JMCS (library provided by JMMC)  
  https://github.com/JMMC-OpenDev/jMCS

- Visualise spectrum from EuroPlanet TAP client

Who will be the next?
Conclusions

- CASSIS useful to astronomers outside FIR/submm/mm field
- Working hard on interoperability; since September, we have implemented:
  - CASSIS online (Java web start / JNLP) with VAMDC
  - SSAP: search all services based on source name
- Need for: update of registries, validation/compliance of protocols, filter services, other tools/apps to display Kelvins
- What’s next: interface to select/combine different databases (VAMDC, sqlite, user-owned)
- Feedback much needed/appreciated! Comments, suggestions, ...:
  - bug report page: http://cassis.irap.omp.eu/?page=bugsreport
  - or send us an email: cassis-team@irap.omp.eu

Links
http://ov-gso.irap.omp.eu/
  (see this page for links to all OV-GSO services)
http://www.vamdc.eu/
http://portal.vamdc.eu/vamdc_portal/home.seam
http://www.jmmc.fr/applauncher_page