CASSIS, a software package to analyze high spectral resolution observations

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ABSTRACT

CASSIS (Centre d’Analyse Scientifique de Spectres Infrarouges et Submillimétriques) is a software package aimed to speed-up the scientific analysis of high spectral resolution observations, particularly suited for broad-band spectral surveys. CASSIS is written in Java and can be run on any platform. It has been extensively tested on Mac OS X, Linux and Windows operating systems. CASSIS is regularly enhanced, and can be easily installed and updated on any modern laptop. It uses a fast SQL-like access to a local spectroscopic database combining the JPL2 and CDMS3 molecular spectroscopic databases, and the atomic spectroscopic database NIST4. The tools available in the currently distributed version (2.9) include, among others, a LTE model and the RADEX5 model connected to the LAMDA6 molecular collisional database. A module allows to build a line list fitting the various transitions of a given species and to directly produce rotational diagrams from these lists. CASSIS is fully integrated into HIPE7, the Herschel Interactive Processing Environment, as a plug-in, since version 5.1.

[Diagram of CASSIS website: http://cassis.cesr.fr]

- Full Java (requires Java 1.6 or above)
- GUI based, under development
- Use of simple configuration file
- User-friendly automatic installer
- Standalone version
- HPNE plug-in win-xp
- Frequent updates reflecting bugs correction
- Automatic and tunable update
- Bugs reporting system

- The database (>1 Gb) is in Sybyl format (no need of any extra software)
- Includes JPL, CDMS and NIST databases
- Is resident on the laptop (no internet connection needed)
- Contains extra parameters used by CASSIS
- Ortho-Para separation for a few species (H2O, D2O, HO2, H2O, HCO+CH3CN, HCN, NH3)
- A/E separation for a few species (CH3OH, CH3CN)
- Allows a quick access with various sorting (E*, frequency, A)
- Can be populated separately by each user to create its own database (export model)

- Quick stack display of spectra for all transitions of a given species and to directly produce rotational diagrams from these lists. CASSIS is fully integrated into HIPE7, the Herschel Interactive Processing Environment, as a plug-in, since version 5.1.

- Existing online documentation
- Existing bugs report system
- Automatic and tunable update
- Quick building of line lists from the fitting module
- Line list used in the Rotational Diagram module to compute Trot and Nrot for various components
- Beam dilution handling
- Manage Template module
- Allows to quickly build-up user’s templates
- Creation of grid models -> VO

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REFERENCES:

4. HITRAN, Basecol, CMF, LUMDA, JPL, CDMS, NIST molecular databases