



Basecol Presentation

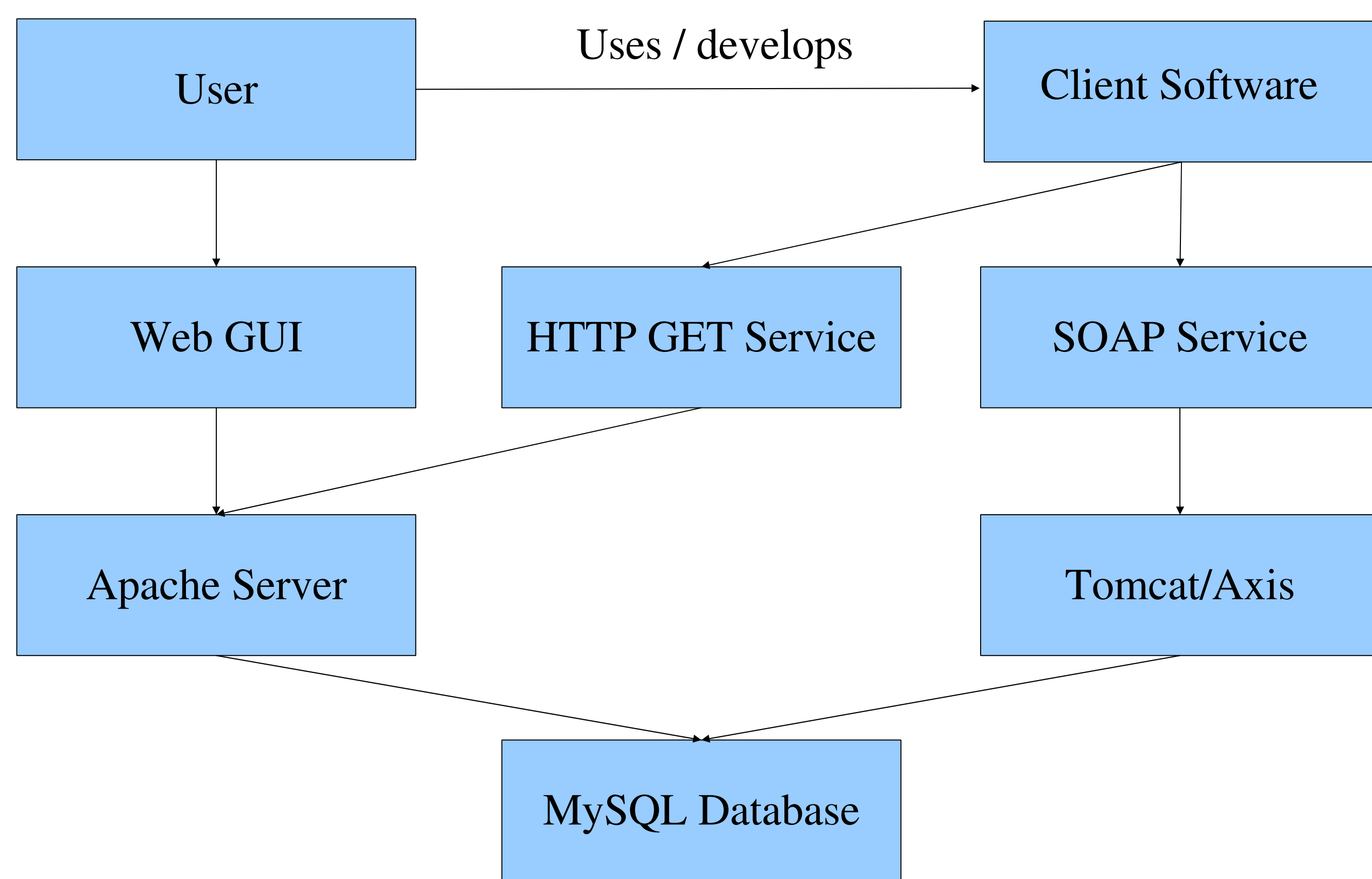
BASECOL is devoted to collisional ro-vibrational excitation of molecules by colliders such as atom, ion, molecule or electron.

The database is composed of several parts:

- > a status page with information about the needs for astrophysics, the current calculations and experiments being carried out, the possibility to contact the relevant groups.
- > a bibliographic database (papers are read and associated to very precise keywords given back to the user in the query response)
- > calculated collisional rates
- > graphical visualization of collisional rates
- > fitted and analytic functions of the collisional rates and the associated coefficients
- > information on the methods used in the calculation of cross sections and rate coefficients (chain of errors)
- > energy levels of the molecules (coming from spectroscopic databases or used in the theoretical calculations)

Basecol Structure

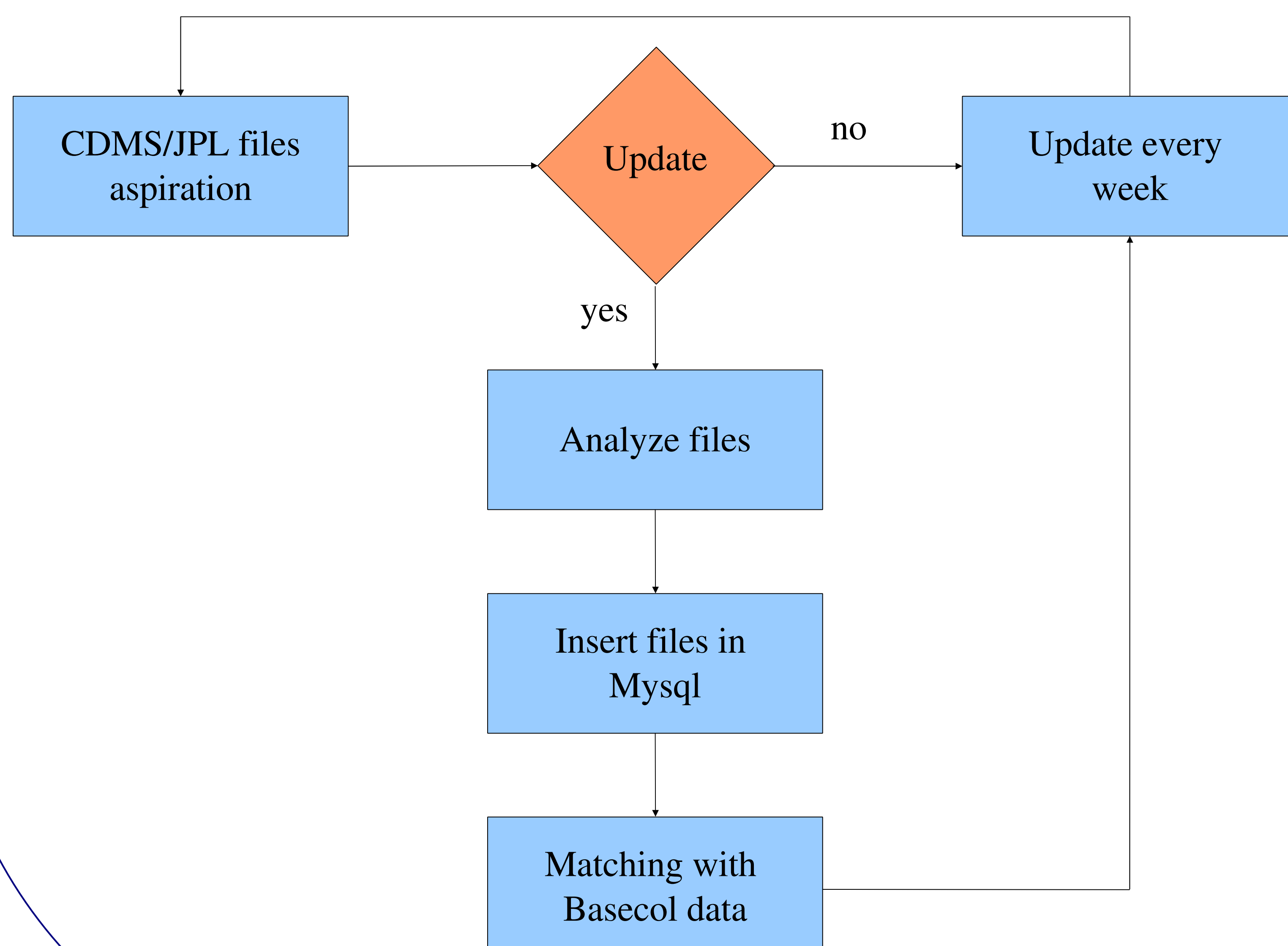
There are two ways to access the data contained in the database. You can either use the web graphical interface or the web service.



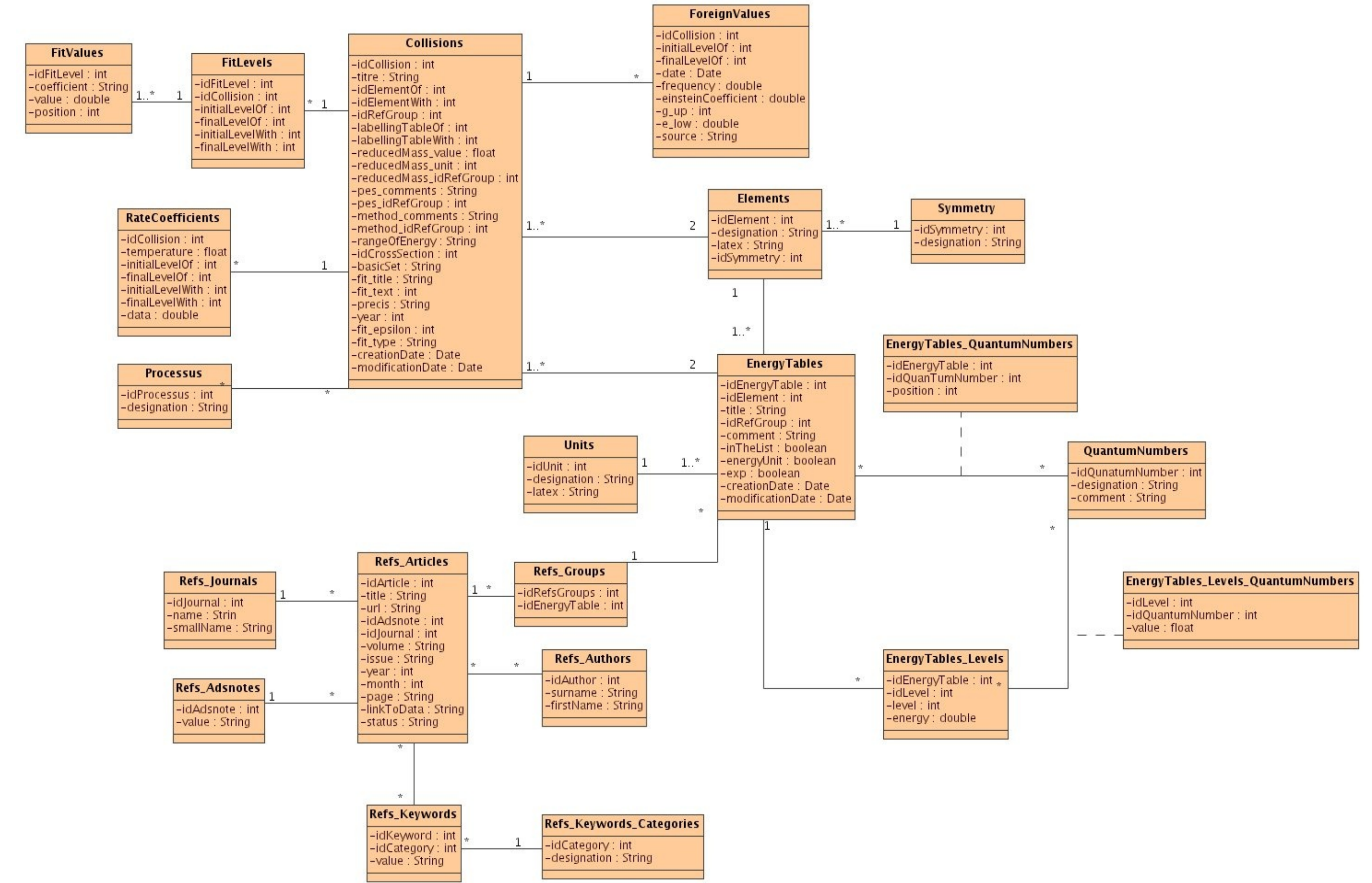
Matching between Basecol and CDMS data

We're currently working on a way to store the JPL and CDMS data so that they could be available through web services, using the Simple Line Access Protocol from the IVOA. Moreover, we use them to complete our own data (for example, to provide Einstein coefficients).

To achieve our goal we use the following process (which has been implemented for the SO2 element) to store those data in a database :



DataModel



Services presentation

Several services are now available. They correspond to the needs of various users and applications :

- > **DALIA dedicated service** : this is an implementation of the SLAP protocol defined by the IVOA (currently in version 0.5). It returns a list of Lines contained in a VOTable. There are 1 compulsory parameter (the wavelength interval) and 2 other parameters that can be used to get more precise results (the name of the molecule and its symmetry).

Service URL : <http://amdpo.obspm.fr/asap0.5/transitions.php?>

Parameters :

- > WAVELENGTH
- > CHEMICAL_ELEMENT
- > CHEMICAL_ELEMENT_SYMMETRY

- > **PDR Code dedicated service** : this service returns fitting coefficients and energy tables available in Basecol for all collisions concerning given target and collider.

Service URL : http://amdpo.obspm.fr/basecol/cgi/getCollisionsList_TV.php?

Parameters :

- > TARGET_CHEMICAL_ELEMENT
- > COLLIDER_CHEMICAL_ELEMENT

- > **MolPop dedicated service** : this service returns rate coefficients and energy tables available in Basecol for all the collisions concerning a given element. If no element has been specified, all the data contained in Basecol are returned.

Service URL : <http://amdpo.obspm.fr/basecol/cgi/getCollisions.php?>

Parameters :

- > CHEMICAL_ELEMENT
- > **CASSIS dedicated service**: in progress

Client tools presentation

Two client applications have been developed specifically for the PDR code and MolPop services. They consist in Python scripts that automatically contact the Basecol services and get the VOTables. Those scripts use a XML configuration file that users can modify according to their needs.

The most interesting aspect of those tools is that they automatically generate ASCII output files in addition to the VOTables. The format of the ASCII files has been designed so that they can be directly used by the applications (the PDR code and MolPop).

Collaborations

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- > Programme National PCMI (Physique Chimie du Milieu Interstellaire)
- VOFrance, Scientific council of Paris Observatory, LERMA