This a summary of some procedures involved when make a barycentric correction:

1. **barystruct\_dbl.pro**

Identifies a given observatory the options are: (Magellan, Keck, Ctio, Lick, Aat).

Same idea as chi\_barystruct.pro based on ASS-II file it extracts information and stores an IDL structure.

1. **chi\_barystruct.pro**

It reads the information from an ASC-II file named **“qbcvel.ascii”.** Such file is expected to have information about a given exposure per line. For every line of the file, a data structure (variable) gets created and stores the following information:

* obsnm : Observation Number
* objnm : Object Name
* bc : Barycentric Corr. (m/s)
* jd : Julian date (double precision) eg 2448489.3462d0
* ha : hour angle of observation
* obtype: Object Type

All data structures are gathered in an array and such array is written to disk as an IDL variable with the file name **“qbcvel.dat”**. The default directory for both files is “…./tous/mir7/bary/ qbcvel. ”

1. **qbary.pro**

The **INPUT** for this procedure is:

* **jd** = julian date (double precision) eg 2448489.3462d0 '

Julian day is the continuous count of days since the beginning of the Julian period.

Another way to express date of the observation.

Date from the .log header file is taken an transformed using the procedure “jdate.pro”

e.g. jdUTC = jdate( [ year, month, dd, hour, minutes])

* **coords** = RA & DEC, in [hours,degrees] eg. [1.75,-15.9d]'

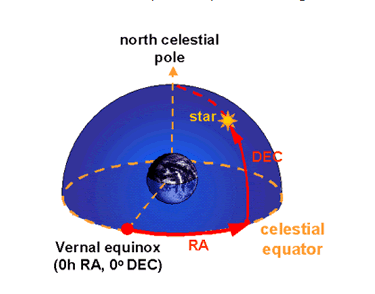
RA: Right ascension measured in hours, minutes and seconds rather than degrees

Dec: Declination

They are used to define an object’s position on the celestial sphere in the equatorial coordinate system.

\*Coordinates are found by using “lookup.pro” which looks up for a file we don’t have.

The default value if the coordinates are not found is coords = [0.d0, 0.d0]



Example: coordinates of a typical star may look something like: 12:52:03.32, -47:34:43.0, J2000.0. In other words, in the year 2000.0, the star had an RA of 12 hours 52 minutes and 3.32 seconds, and a Dec of 47 degrees 34 arcminutes 43 arcseconds south of the celestial equator

* **EPOCH** = for which coords are valid, eg. 2000.'

The current epoch is referred to as J2000.0, so that locations of celestial objects are given relative to the coordinates as they were in the year 2000.

If value not found. Then the default value is 2000.d0

Value is retrieved using “lookup.pro”

* **obs** = observatory [optional] (default is LICK)

The procedure was adopted for the use of many observatories. We are interested in Chiron.

Therefore, obs=’ctio’

* **pm** = proper motion [ra,dec] in ARCsec/year [optional]

Retrieved using “lookup.pro”

If value is not found then it is given a default value of pm= [0.d0, 0.d0]

* **rad\_vel** = Barycentric Radial Velocity in km/s [optional]

No used but can be retrieved with ‘lookup.pro’

* **parlax** = parallax in arc sec [optional]

Not used but can be retrieved with ‘lookup.pro’

\*It gets used to remove the secular acceleration (rm\_secacc())

The output :

* cz = c\*z [m/s] (z= relativistic redshift) DON’T WE WANT AN delta wavelength ?
* ha = hour angle of observation

Summary : We need the coordinates of Sirius (right ascension and declination )

1. **qbarylog.pro**

Looks for the following file named “ ctio\_st.dat “ : Star positions

Creates the ASC-II file named : “qbcvel.ascii”

This procedure calls “qbary.pro”

Default directory is : '/tous/mir7/bary/'

We are missing some files. Please refer to table at the bottom.

By default, it skips “B STARS” E.g. Moon and HR

It has a dependency named “lookup.pro” which finds the following information of a given star:

* Coordinates:
* Equinox:
* Proper Motion:
* Parallax:
* Among others

1. **obssite.pro**

Stores the longitude, the latitude, and the height of CTIO + some other observatories

1. **lookup.pro**

According to comments:

* EQUINOX 2000 is now assumed
* “To add new stars on the fly, edit the file: kother.ascii (We don’t have this file )

Ultimately all stars being searched for planets should be in <obs>\_st.dat

Note a translation file is used to translate starnames into HIP

numbers.”

* It finds all the following information given the name of a star

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Format** | **Notes** |
| Cords | [ra,dec] | Decimal [hours, degrees] |
| epoch | float | Epoch of coordinates relevance |
| pm | [ra\_motion, dec\_motion] | Proper motion |
| prlax |  |  |
| radvel | float | Radial Velocity |
| raarr | Array version of RA |  |
| decarr | Array version of DEC |  |

1. **rm\_secacc.pro**

WE ARE MISSING THIS PROCEDURE.

Use to remove the secular acceleration

**Missing Files:**

|  |  |  |
| --- | --- | --- |
| **File name** | **Where it gets called** | **Notes** |
| kother.ascii | Lookup.pro | Need to be modified to account for Sirius |
| <obs>\_st.dat | Look.pro | All stars being searched for planets should be in  This format |
| ktranslation.dat | Lookup.pro | Use to give HIP(HIPPARCOS) numbers to a start name. |
| qother.ascii |  |  |
| hip2.dat |  |  |
| hj\_st.dat |  |  |

\*HIPPARCOS I believe is a catalogue for stars based on the satellite HIPPARCOS

Missing Procedure:

1. rm\_secacc.pro

**Notes:**

Do you recall that part of the directory structure we have is “….chiron\tous\**mir7**\.....”. The mir7 I believe is a shortcut for the specific observatory we are dealing with, CTIO. The other options are:

mir5 : Magellan

mir3: Keck

mir1: Lick

mir2: Aat

mir7: Ctio

From reading the “qbarylog.pro” procedure I got the feeling that I am producing an old version of the .log files (produced by logmaker.pro) after searching throughout all files I found a procedure “chi\_log.pro” although this procedure was saved as a text file with the name “QC” (therefore I did not know about it). This script seems to the more updated. I will try to make it run these coming days.

I will also try to make “chi\_splice.pro” to run. (for some reason I was not aware of this file before)

Last modification seen in the code by somebody else is now “2012 by MJG” (Before was 2003)

**Further programs to look at:**

Analyze noise.pro

Ordsshift.pro

ck\_snr.pro