ezRA - Easy Radio Astronomy - ezSky

- Nov-18-2022

ezRA - Easy Radio Astronomy
https://github.com/tedcline/ezRA

The ezSky program is a Sky mapper, which reads one or more condensed data .ezb files, and creates several plot image files to study.

ezSky Plot File List

Each ezSky plot image filename starts with “ezSky”, followed by a 3-digit number, followed by a description, followed by “.png” . The first plot filename is “ezSky010raH.png”.

The ezSky plot files are organized into groups. The groupings allows the -ezSkyPlotRangeL arguments to speed execution by creating only the related plots that are wanted.

The ezSky0N0 plot files are 2-dimensional plots of input condensed data .ezb file sample “coordinate” values, where N is the .ezb file column number (plotting value by sample number). These are “coordinate” values unrelated to radio, such as declination and Galactic Latitude. If these input file data values are confused, the created sky plots will be confused.

ezSky010raH.png	- Right Ascension of sample (hours)
ezSky020decDeg.png	- Declination of sample (degrees)
ezSky030gLatDeg.png	- Galactic Latitude of sample (degrees)
ezSky040gLonDeg.png	- Galactic Longitude of sample (degrees)
ezSky070azDeg.png	- Azimuth value of sample (degrees)
ezSky080elDeg.png	- Elevation value of sample (degrees)

Similarly, the ezSky100 plot files are 2-dimensional plots of input condensed data .ezb file “signal” values derived from radio (plotting value by sample number). Each ezSky100 plot image filename starts with “ezSky100input_”, followed by a 2-digit number of the .ezb file column number, followed by the column name, followed by “.png”. An example plot filename is “ezSky100input_10AntAvg.png”. Using the “-ezSkyInput” command line argument, any of the 0-19 columns may be used. The default 14 column is the AntB signal. Again, if these input file data values are confused, the created sky plots will be confused.

To allow sky plot comparisons using different column inputs, a similar column plot naming convention is used for the ezSky200RBVO, ezSky300RB, ezSky301RBT, ezSky400RI, ezSky500GMI, ezSky501GSI and ezSky600azEl sky plots. The ezSky309RBTC plot is independent of input column.

Using the default “-ezSkyInput” column 14, the ezSky plot filenames would be:

ezSky100input_14AntBAvg.png	- input column data sample values
ezSky200RBVO_14AntBAvg.png	- sky RaDec map with Background, power Vertical Offset
ezSky300RB_14AntBAvg.png	- sky RaDec map with Background, power color
ezSky301RBT_14AntBAvg.png	- sky RaDec map with Background, Tall power color
ezSky309RBTC.png	- sky RaDec map with Background, Tall Count
ezSky400RI_14AntBAvg.png	- sky RaDec map, Interpolated power
ezSky500GMI_14AntBAvg.png	- sky Galactic Mercator projection map, Interpolated Power
ezSky501GSI_14AntBAvg.png	- sky Galactic Sinusoidal projection map, Interpolated Power
ezSky600azEl_14AntBAvg.png	- sky AzEl map, power color

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Blah, blah, blah

The goal:

Then compare your Galactic coordinate plot to

https://irsa.ipac.caltech.edu/data/Planck/release_2/external-data/img/image036.png

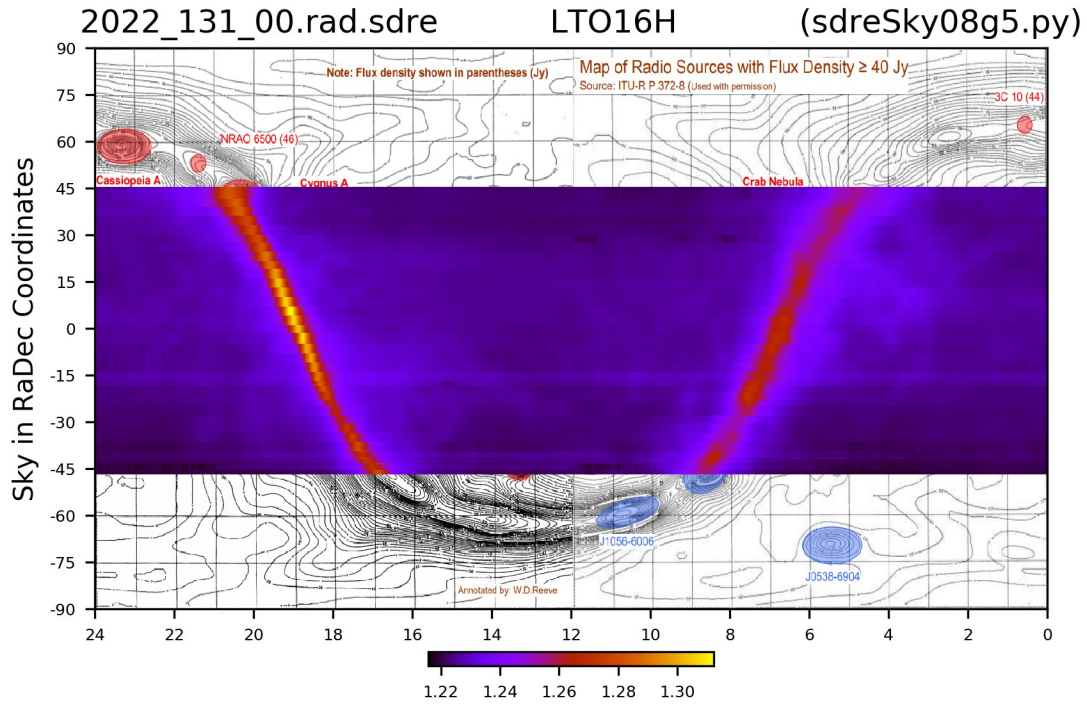
(from https://irsa.ipac.caltech.edu/data/Planck/release_2/external-data/external_maps.html)

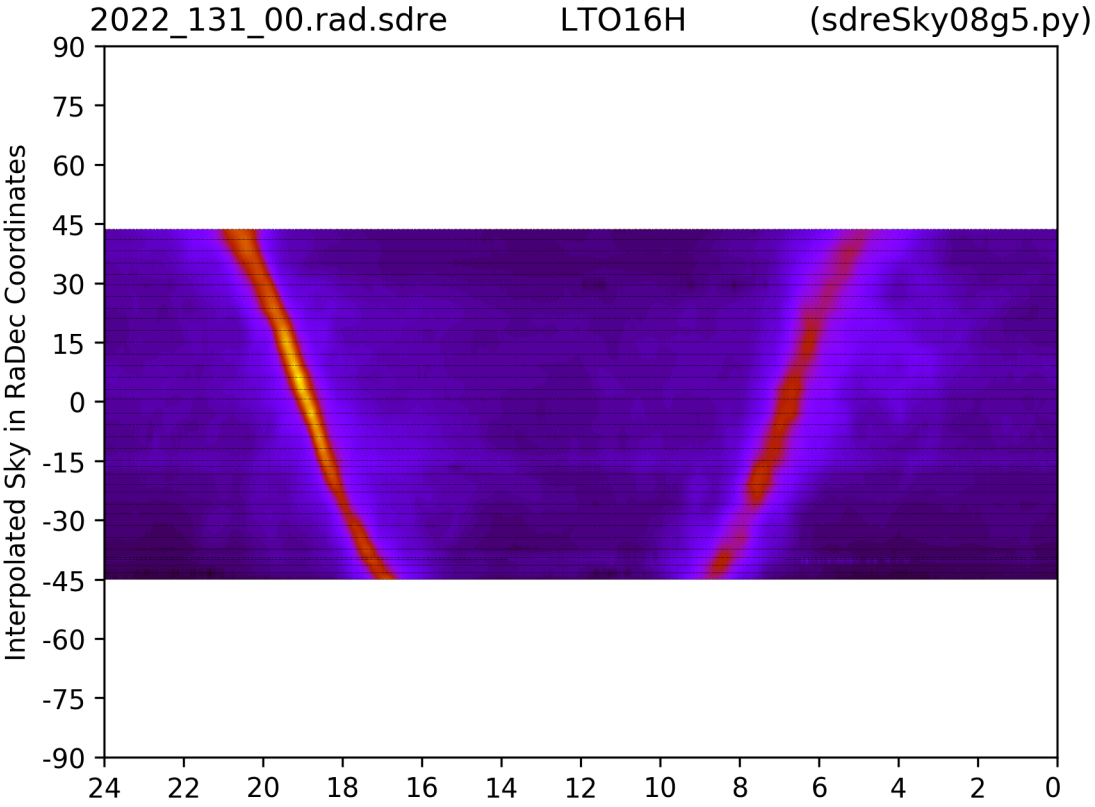
and note the same flare from center upwards.

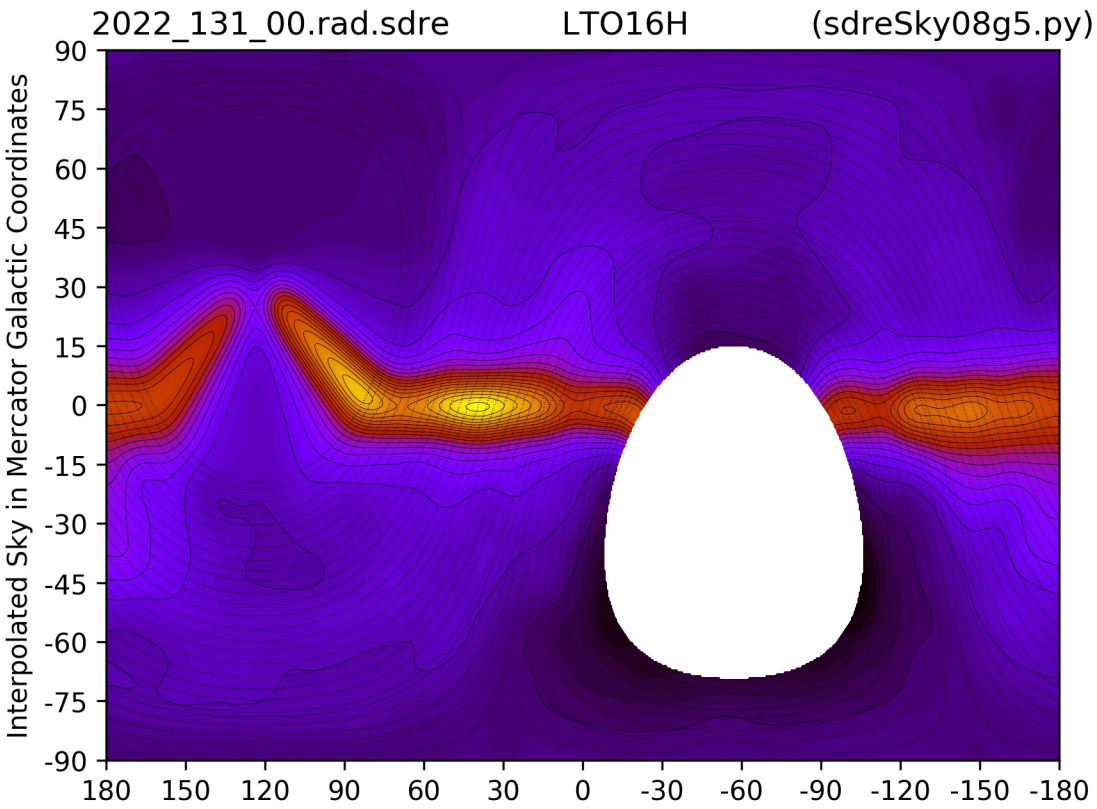
Or compare to this cool Max Planck Society video (highlighting approaching gas to receding gas),

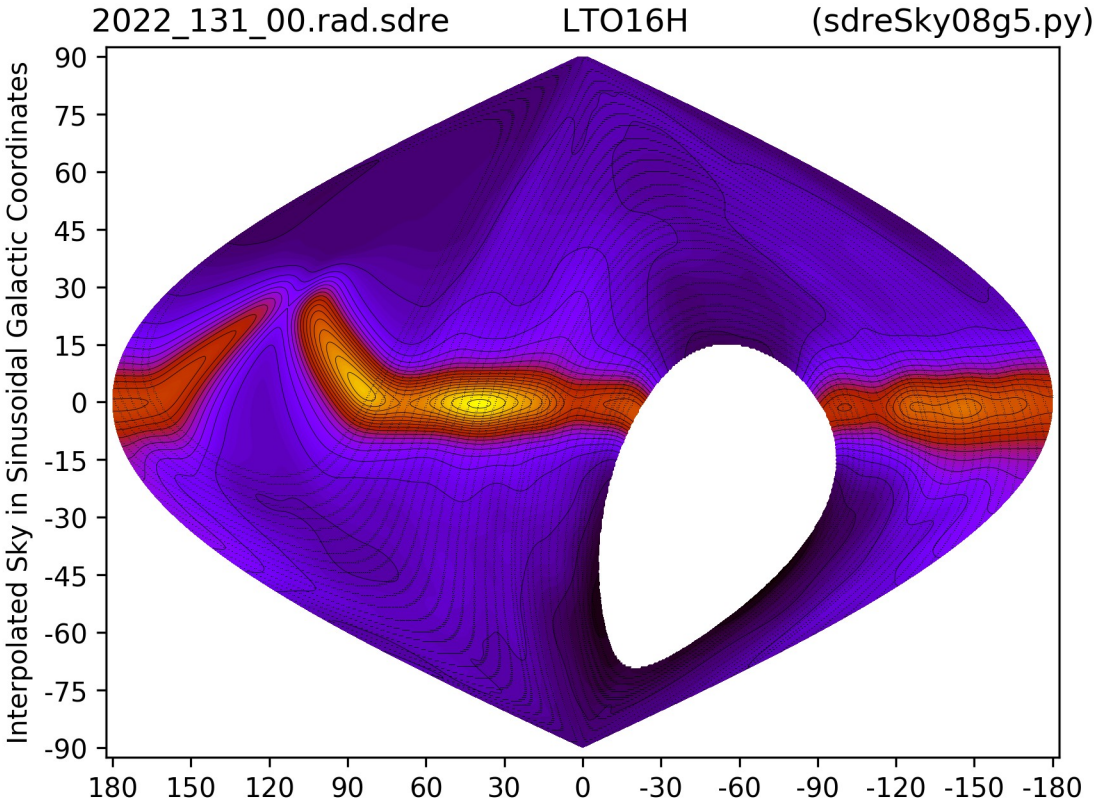
https://www.youtube.com/watch?v=Q2mgpsTFuV8&t=1s&ab_channel=MaxPlanckSociety

So far:


2022_131_00.rad.sdre
LTO16H
(sdreSky08g5.py)
Note: Flux density shown in parentheses (Jy)
Map of Radio Sources with Flux Density ≥ 40 Jy
Source: ITU-R P.372-8 (Used with permission)
3C 10 (44)
NRAC 6500 (46)
Cassiopeia A
Cygnus A
Crab Nebula
J1056-6006
J0538-6904
Annotated by W.D.Reeve
Sky in RaDec Coordinates
90
75
60
45
30
15
0
-15
-30
-45
-60
-75
-90
24
22
20
18
16
14
12
10
8
6
4
2
0
1.22
1.24
1.26
1.28
1.30


2022_131_00.rad.sdre
LTO16H
(sdreSky08g5.py)
Interpolated Sky in RaDec Coordinates
90
75
60
45
30
15
0
-15
-30
-45
-60
-75
-90
24
22
20
18
16
14
12
10
8
6
4
2
0


2022_131_00.rad.sdre LTO16H (sdreSky08g5.py)
Interpolated Sky in Mercator Galactic Coordinates
90
75
60
45
30
15
0
-15
-30
-45
-60
-75
-90
180 150 120 90 60 30 0 -30 -60 -90 -120 -150 -180


2022_131_00.rad.sdre LTO16H (sdreSky08g5.py)
Interpolated Sky in Sinusoidal Galactic Coordinates
90
75
60
45
30
15
0
-15
-30
-45
-60
-75
-90
180 150 120 90 60 30 0 -30 -60 -90 -120 -150 -180