besl Documentation

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Brian Svoboda

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BESL is a general purpose library written in python for astronomical research by Brian Svoboda. The modules available largely involve manipulating the data for the Bolocam Galactic Plane Survey (BGPS) and other Galactic plane surveys.

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CHAPTER 1

Full API Specification

besl

BGPS Peak Flux Extract

Extract peak values from BGPS maps

class besl.bgps_peak_flux_extract.**Dirs**
Object to hold directories for interactive path editing

besl.bgps_peak_flux_extract.**extract_peak_bgps_props**(*out_filen='bgps_pk_extract'*)
Extract peak flux and noise values from the BGPS maps in Jy/beam. Citation: Ginsburg et al. (2013).

out_filen [string] output catalog file in CSV format

molcat_pk [pandas.DataFrame] Output catalog in a pandas DataFrame object

Coordinates

Routines for manipulating coordinates.

besl.coord.**dec2sexstr**(*deci*, *sfigs=1*, *hd='h'*, *lead_psign=False*)
Convert decimal degree to a sexagesimal string of the form 'HH:MM:SS.S' by default.

sfigs [number] Number of significant figures after decimal in seconds

hd [string, ('h', 'd')] Hour or degree convention

lead_sign [Boolean] Whether to include the leading sign +/- in string

besl.coord.**eq2gal**(*ra*, *dec*, *epoch='2000'*)
Convert equatorial coordinates in decimal degrees to Galactic.

ra : number dec : number epoch : string, default '2000'

glon : number glat : number

besl.coord.**gal2eq**(*glon*, *glat*, *epoch='2000'*)
Convert Galactic coordinates in decimal degrees to equatorial.

glon : number glat : number epoch : string, default '2000'

ra : number dec : number

besl.coord.**nearest_match_coords**(*needle*, *haystack*, *min_sep*, *nearest=True*)
Search within a radius for sources between a "needle" single (lon, lat) coordinate and a "haystack" list of coordinates in decimal degrees. Use sorted lists for best performance.

needle [array like] List or tuple of (lon, lat) in decimal degrees

haystack [numpy array] 2 x N list of coordinates in decimal degrees

min_sep [number] Minimum seperation in arcseconds.

nearest [bool, default True] Return only the nearest match

min_index [number or np.array] Array index (or indices) of nearest object

min_dist [number or np.array] Distance (or distances) to nearest matched object

matchn [number] Number of matches within the minimum seperation

besl.coord.**pd_eq2gal**(*df, labels, new_labels=['glon', 'glat'], epoch='2000'*)
Convert two coordinate columns of a pandas DataFrame from equatorial to Galactic coordinates, both in decimal degrees.

df : pd.DataFrame labels : list

Column names of df

new_labels : list, default 'glon' and 'glat' epoch : string, default '2000'

df [pd.DataFrame] With added columns

besl.coord.**pd_gal2eq**(*df, labels, new_labels=['ra', 'dec'], epoch='2000'*)
Convert two coordinate columns of a pandas DataFrame from Galactic to equatorial coordinates, both in decimal degrees.

df : pd.DataFrame labels : list

Column names of df

new_labels : list, default names 'ra' and 'dec' epoch : string, default '2000'

df [pd.DataFrame] With added columns

besl.coord.**sep**(*lat1*, *lon1*, *lat2*, *lon2*, *hd='d'*)
Calculate seperation between two coordinates in decimal degrees. If using longitude in hours set parameter hd to "h".

hd [string, ('h', 'd')] Hour or degree convention

besl.coord.**sep_coords**(*needle*, *haystack*)
Match a "needle" single (lon, lat) coordinate to a "haystack" list of coordinates in decimal degrees. Use sorted lists for best performance.

needle [array like] List or tuple of (lon, lat) in decimal degrees

haystack [numpy array] 2 x N list of coordinates in decimal degrees

sep [numpy array] Array of seperations compared to original list in radians

besl.coord.**sexstr2dec**(*sexstr*, *sep=':'*, *hd='h'*)
Convert a sexagesimal string of delimited by a seperator character, eg "+HH:MM:SS.S" with ":", into a decimal float. Can also be a tuple of numbers.

sexstr [str, tuple] Sexagesimal coordinate in seperated string or tuple of numbers

sep [string] Seperator character between hours, minutes, and seconds

hd [string, ('h', 'd')] Hour or degree convention

Miscellaneous Functions

besl.misc.**logit**()
Log IPython session to log file tagged by date and time: ipython_log_YY-MM-DD_HH:MM.py.

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