Description of variables used

For all variables: *A for HCO+, B for HCN* but only A is listed below

Lists from Gaussian fits

xPixA, yPixA # pixel numbers that successfully had a gaussian fit
glatA, glongA # galactic coordinates for the above pixels
TmbA # peak temperature with correction factor of 0.6 (K)
fwhmA # full width at half maximum (FWHM) linewidth of gaussian curve (km/s)
vlsrA # velocity of peak (km/s)

Temperatures

xPixT, yPixT # pixel numbers of temperature map (have been re-gridded to match sample molecule's ranges)
glatT, glongT # galactic coordinates for the above pixels
Tk # kinetic temperature of each pixel from temperature map

Radex col den function

radexcolden(xPix, yPix, glong, glat, tmb, fwhm, vlsr, 'mole', 'radex inp file', 'radex out file', 'column density file')

Lists used in the function:
xPixA, yPixA, glongA, glatA, tmbA, fwhmA, vlsrA from gaussian fit data file (different for each molecule)

- 'mole' name must be same as the molecule used in the 'radex inp file'

xPixT, yPixT, Tk from temperature file

- Lists that aren't passed through function because the values do not differ between molecules

Lists created by the function:
tk, xx, yy

- Lists of the pixels and corresponding kinetic temperature for the pixels from the temperature map data that we have Gaussian fit data for

colDen, xPixFull, yPixFull, glongFull, glatFull, tkFull, tmbFull, vlsrFull, fwhmFull

- Lists containing data for all pixels that had data from a gaussian fit and a kinetic temperature from the temperature map

Column density ratio plot

xPixA, yPixA, glatA, glatB, nA

- Data from column density file

glatAshort, glongAshort
- Galactic coordinate lists with no dublicate values

savedglat, savedglong
- Either glatAshort or glatBshort
- Either glongAshort or glongBshort
- Read comments to modify code to choose larger or smaller pixel range

largeArray
- Array of desired size of zeros for chosen span of coordinates

largeCoord
- Zip of coordinates from savedglat and savedglong
- Each element: (savedglat[i], savedglong[i])

smallCoord
- Zip of coordinates of the pixels that have non-zero values for N(HCO+) and N(HCN)
- Each element: (savedglat[i], savedglong[i], ratio[i] of N(HCO+)/N(HCN)

glatMin, glatMax, glongMin, glongMax
- Upper and lower bounds of x and y range for the plot

u, v
- Evenly spaced numbers over glat and glong range respectively

```
breaksFill     # intervals for the contour fill
breaksBar      # intervals for the colour bar
breaksLines    # intervals for the contour lines
breaksy        # intervals for y axis ticks
breaksx        # intervals for x axis ticks

CS1            # filled contour plot
CS2            # contour lines
```