Subject: Relative distances between vector elements and search for matches in other vector.
Posted by Tito on Wed, 25 Apr 2012 14:03:00 GMT
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Hallo all
I am new in IDL but I am increasing my level everyday and I am so happy that I discover IDL!!!
I stuck very badly in one algorithm that I am developing for my Pipeline.
I am searching for a routine or method to:

1st. define the relative distances between vector elements (e.g. distances between peaks in the spectrum(allready identified))

2nd. to identify the lines from another vector (bigger or smaller in array size)
based on the criteria of the above (1st.)

E.g.

I have:
RATIO_STLINES FLOAT = Array[21]
0.00000 -0.171038 -0.594733 -1.21922 -1.40923 -1.52994 -1.56168 -1.92495
-2.28294 -2.34803 -2.38444
-3.15909 -3.46812 -3.61399 -3.97221 -4.09896 -4.27114 -4.43637 -5.69552
-6.05595 -6.23174

RATIO_CAT FLOAT = Array[44]
0.00000 -0.209757 -0.249368 -0.930353 -1.05059 -1.21623 -1.21693
-1.74758 -1.75778 -1.77888 -1.78749
-2.03075 -2.22571 -2.99081 -3.29190 -3.31060 -3.42393 -3.43413 -3.43844
-3.44364 -3.59758 -3.61648
-3.76892 -3.80183 -3.92147 -4.26676 -4.53263 -5.02637 -5.31455 -5.35194
-5.52650 -5.59132 -5.75987
-5.81128 -6.60440 -6.68362 -6.71653 -6.73373 -6.81295 -6.95529 -7.23017
-7.48834 -7.66608 -7.90535

And the RATIO_CAT consist the lines from RATIO_STLINES (it is possible not all of them to be in the RATIO_CAT)

So RATIO_STLINES is lets say shifted respect to RATIO_CAT and I want to identify lines based on their line ratios.

I want to mention that I already made a working algorithm but I am 1000 % sure that the more experienced people here can help me to make it much more elegant and efficient. Later on I have a other problem on that I stuck but lets see can you help me on that and it is possible to solve it my self... if not I will post again :(

Here is the code:

```
 ;Finding the peak of each line on the spectrum:

peak = peaks(1-chip,0.9) ; finding the peaks from JJohnson IDL.
ddd = xaxis[peak]     ;wavelengths of the finded lines.
lines = chip[peak]    ;depts of the finded lines.
;xx - HITRAN lines
;z1- VALD catalog wavelengths
;z2 - VALD catalog line depths

;Finding the relative distance between the HITRAN lines (nm):
ratio=fltarr(n_elements(xx))

for j=0L, n_elements(xx)-1 do begin
  ratio[j] =  xx[0] - xx[j]
  endfor

;Finding the relative distance between each line on the spectrum:
ratio2=fltarr(n_elements(ddd))

for jj=0L, n_elements(ddd)-1 do begin
  ratio2[jj] =  ddd[0] - ddd[jj]
endfor

;Finding the relative distance between the lines from the VALD catalog:
ratio_vald=fltarr(n_elements(z1))

for jjj=0L, n_elements(z1)-1 do begin
  ratio_vald[jjj] =  z1[0] - z1[jjj]
endfor


; Identify the telluric lines on the spectra. Only stellar lines will be left.
telluric_depts = fltarr(n_elements(xx))
telluric_waves = fltarr(n_elements(xx))
stel_dep = []
stel_wave = []
stel_ra = []
for jjj = 0L, n_elements(ratio2)-1 do begin
  a = where((ratio GT (ratio2[jjj] - 0.05)) and (ratio LT (ratio2[jjj] + 0.05)),count)

  if count gt 0d0 then begin
  telluric_depts[a] = lines[jjj]
  telluric_waves[a] = ddd[jjj]
  endif

  if count le 0d0 then begin
  stel_dep =[stel_dep, lines[jjj]]
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  stel_wave =[stel_wave, ddd[jjj]]
  ;stel_ra = [stel_ra,ratio2[jjj]]
  endif

endfor

;Finding the relative distance between the lines that left from the science spectrum:

ratio_stlines = fltarr(n_elements(stel_wave))
for k = 0L, n_elements(stel_wave) - 1 do begin
  ratio_stlines[k] =  stel_wave[0] - stel_wave[k]
endfor
```

And I will stop here because I have more problems below...

Thank you very much in advance!
