Subject: Re: how to extend a vector from size A to size B, (A<B) without "damage" the data in A
Posted by Craig Markwardt on Fri, 09 Mar 2012 05:09:06 GMT
View Forum Message <> Reply to Message

On Thursday, March 8, 2012 6:42:10 PM UTC-5, Tito wrote:
> Dear David,
> Dear Craig,
>
> First of all I want to thank you both for your answers!
>
> David, the "congrid" function did exactly what I wanted! Thank you very much for the tip!
>
> However, another problem just rise and this lead to my answer to Craig....
>
> First let me explain my set up and then I will discus my constrains about the "congrid" function.
>
> I have "A" vector which I use for synthetic mask spectrum, witch I will cross-correlate with my science spectra in order to determine the RV signal.
> This "A" vector is actually extracted from the HITRAN catalog (atmosphere absorption line database) for the C02 molecule in the IR. Actually this is teluric lines witch in other hand also present on my science spectra.
>
> So I just extracted all the C02 line in range from 6222 to 6248 cm^-1 for example. I convert them to wavelengths and it turn out that in this range I have around 970 C02 lines, BUT only 20 of them are the sharp and deep lines that I need (the telluric). So this "A" 970 array vector is indeed made on a different grid then the "B" vector. from this 970 element vector I am interested only in about 20 of the lines. The others are noise or very faint lines in that I don't care but I take them in order to represent my experiment more accurate.
>
> The "B" vector is the spectra from the 1024 pixel IR detector so it has 1024 elements.
>
> I want to cross-correlate A and B. that means I have to "extend" the A vector to 1024 elements with out harm the relative distances between those 20 lines. in other words I need to increase the resolution of this vector without damage the intensity of the lines... interpol(A) just make the plot look very different from the original.
>
> Craig, now I can see that you are right...
> Vector B extracted from the spectrograph is probably irregular in the sense that the wavelength solution from pixel 1 to pixel 1024 is not linear witch is not the case for the intensity and wavelength base extracted from HITRAN. There the teluric lines are equidistant all over the array for A and for the B vector the may vary a bit over the array on the wave length solution from the pipeline .
> In order to cross-correlate correctly two of the vectors B and the expanded A must be on the same grid is that right?
>
> I have to do the same for the stellar lines synthetic template mask, but ones I am done with this I will do it much more easy!

>
> As I can see in "interpol" program is written "....Linearly interpolate vectors with a regular or IRREGULAR grid."
>
> Witch I am not sure "congrid" does.
> However I have to experiment....
>
> At last I need a function that will keep the nice shape the intensity lines like "congrid" and to be capable to "interpolate" in irregular grids so I can put in the end the two vectors in the same wavelength or pixel grid and to cross-correlate them.
>
> I really hope I was clear.... I will experiment with "congrid" and also with you suggestions Craig...
>
> I hope I will find the answer of my problems alone, but more help is always welcome and appreciate.

You must have wavelength labels, i.e. sample positions, for each spectrum. That is vital information that shows how regularly (or irregularly) the spectrum is sampled. If you are not using this information when you interpolate, no wonder you are getting suspicious results.

INTERPOL is capable of interpolating with an irregular grid. You just need to pass it the sample positions.

Craig
