Subject: Re: possible bug with center keyword option for FFT
Posted by R.G.Stockwell on Fri, 11 Feb 2011 20:41:33 GMT
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"R.G. Stockwell" wrote in message news:ij46h9$cg9$1@speranza.aioe.org...

>
>
> "Mark" wrote in message
> news:babf90b7-e4a3-48bc-aecf-ae81e4a055d4@o18g2000prh.google groups.com...
>
>
> 2: According to the documentation, with the center keyword off in
> FFT(), element(0) is the FFT coefficient for the zero frequency. With
> the keyword center set, this coefficient is shifted to the 'center' of
> the array. This is a little ambiguous, especially when an array might
> have an even or odd number of points in a dimension.

You are absolutely correct. This is an error in IDL.

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also, for the odd case, IDL is also wrong.
When there is an odd number of points, the actual nyquist value is not
sampled. (great trick question for anyone who thinks the nyquist is 1/(2T))

so you have, N = 7, and take T = 1 as the sampling interval:
I, freq

0, DC
1, 1/N
2, 2/N
3, 3/N
4, -3/N
5, -2/N
6, -1/N

so the 'centered' fft is:
i, old i, freq

0, 4, -3/N
1, 5, -2/N
2, 6, -1/N
3, 0, DC
4, 1, 1/N
5, 2, 2/N

6, 3, 3/N

From the example shown, the dc went to the 4th index when centered, it MUST go to the 3rd index.

cheers,
bob

PS, I hope it's obvious how I am writing that. the first number is the current index of the spectrum array. Then the next column is the "old" index based on the result of a straight FFT (i.e with out the center keyword), then the final column is what the frequency value is, of a N point time series with sampling T = 1, and here N = 7 but I thought that it would be confusing to write out the 7 each time.

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