
Subject: possible bug with center keyword option for FFT
Posted by [astroboy2k](#) on Fri, 11 Feb 2011 17:58:18 GMT
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Hello,

I sent the following to itvvis support, but I was wondering if anyone has an insights into this. Basically, setting the center keyword for FFT() gives an output that is shifted incorrectly. I'm doing some really perverse stuff where it's really important to be sure what frequency(angle) an output element from FFT() corresponds to....

Thanks,

Mark

Hello,

I've been looking at the output from the IDL FFT function and I have two things to ask about

1: It would be nice for the function to return the angles/frequencies (ie, zero to 2π , or $-\pi$ to π , say) corresponding to the coefficients. There's a formula given for that in the documentation, but I'd feel better if IDL supplied that information, especially considering my second point.

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.

From what I can tell, FFT(/center) isn't working quite as advertised. Here's a code snippet:

```
box=fltarr(8)
box(0:1)=1.
box(6:7)=1.
```

```
ff=fft(box,-1)
ff_cent=fft(box,-1,/cent)
```

```
ff=float(ff)
ff_cent=float(ff_cent)
```

```
;printing the angles/frequencies and ff and ff_cent coefficients I
```

get:

CENTER KEYWORD = 0			CENTER KEYWORD SET		
ANGLE	FFT	COEFF	ANGLE	FFT	COEFF
0	0	0.75000	0	0.03661	
1	45	0.21339	45	0.00000	
2	90	-0.12500	90	0.03661	
3	135	0.03661	135	-0.12500	
4	180	0.00000	180	0.21339	
5	-135	0.03661	225	0.75000	
6	-90	-0.12500	270	0.21339	
7	-45	0.21339	315	-0.12500	

For ff, the zero frequency point is .75. However, in ff_cent it appears at index=5. Shouldn't it be at index=4? That is, a shift of 180 degrees?

FFT(arr, 1, /center) seems to work OK, if arr is the output from FFT(arr0,-1,/center), of course.
