
Subject: Re: FFT help

Posted by [K. Bowman](#) on Fri, 05 Nov 2004 14:43:45 GMT

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In article

<26d23fcf09dce26228fc67cf81ec832f@localhost.talkaboutprogramming.com>,
"IDLmastertobe" <shi_lee@hotmail.com> wrote:

> Hey, I am experiencing problem using fft function. Since FFT function
> provides the fourier transform of a certain input, for example,
> $8\cos(\pi x/6)$, I would expect an amplitude of 4 at 2 shifted frequencies,
> namely $-\pi/6$ and $\pi/6$. However after I recieved data from the FFT, I
> recieved some amplitudes close to 2 at some random locations, can anyone
> explain to me why it happened? Thanks for your time.
>

This function

$\cos(\pi x/6.0)$

is only a small part of a complete cosine wave and has a jump
discontinuity at the ends. (Try plotting it.)

Perhaps you mean

```
IDL> x = findgen(16)/16.0
IDL> xx = fft(8.0*cos(6.0*pi*x))
IDL> for i = 0, 15 do print, xx[i]
( 1.66889e-07, 0.00000)
( 9.40551e-07, 2.41026e-07)
(-1.35589e-07, 6.01780e-07)
( 4.00000, 6.09532e-07)
(-3.99355e-07, 2.98023e-08)
(-2.53313e-07, 1.34857e-08)
( 1.59439e-07, -5.38710e-08)
(-4.56263e-07, -2.95416e-07)
( 5.84122e-07, -0.00000)
(-4.56263e-07, 2.95416e-07)
( 1.59439e-07, 5.38710e-08)
(-2.53313e-07, -1.34857e-08)
(-3.99355e-07, -2.98023e-08)
( 4.00000, -6.09532e-07)
(-1.35589e-07, -6.01780e-07)
( 9.40551e-07, -2.41026e-07)
```

Ken Bowman
