Subject: Re: FFT example. Help!
Posted by Julio Maranhao on Tue, 02 May 2000 07:00:00 GMT
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If you want to use the IDL FFT functions in continuous mathematical

straight. You must understand how real signals are discretized and processed. A classical book is "Discrete-Time Signal Processing" of Oppenheim&Schafer. I suggest you to talk to a professor or a person that understand Discrete Fourier Transform for a fast study. All I can advance is that the "key" of DFT is : if the signal is periodic and discrete (a vector in IDL could be a "window" of this infinite signal, for instance) than the Transform is periodic and discrete.

For example, try these:

```
IDL> a=[1.0, 1, 1, 1, 0, 0, 0, 0]
IDL> window,0  &  plot,abs(fft(a,-1))
IDL> b=fltarr(500)  &  b[0:7]=a
IDL> window,1  &  plot,abs(fft(b,-1))
```

In the second plot it seems more like a sinc, because I added more zero points in the vector. The other fft is undersampled. This is one of the innumerous properties of discrete periodic signals. And this is only part of the iceberg. :-). Good luck.

mensagem:390DA60B.B8F5CEBA@email.sps.mot.com...
> I am trying to understand the FFT routine IDL uses. Part of my problem
> is that though I am familiar with Fourier transforms, I am somewhat
> unfamiliar with the fast Fourier transform.
>
> Has anybody written a program that works through a known transform using
> the FFT procedure? In particular, I want to be able to plot out F(u) vs
> u and have it "make sense".
>
> An example of a known transform is
>
> For
> f(x) = 1 for -1/2<x<1/2
>   = 0 else
>
> the Fourier transform F(u) is given by
>
> F(u)=int(f(x)*exp(-j*2*pi*ux)*dx
>   =[sin(pi*u)]/pi*u
>

>
> thanks-Peter Brooker
>