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Subject: Using 1D FFT to decompose the provided hurricane data in terms of wavenumbers.

Posted by [twiel002](#) on Wed, 04 Mar 2015 23:10:54 GMT

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I have 240x240 array of hurricane wind speed.

1) I need to covert to polar coordinates and plot the speed on a contour map with a radius of [-108,108], however what I have doesn't appear to be correct.

My Code:

Pro Projet2COORD

;;;---Reading in the data---;;;

```
rows = 240
cols = 240
spd = FltArr(240,240)
OpenR, lun, 'speed.csv', /Get_Lun
ReadF, lun, spd
Free_Lun, lun
print, spd
```

```
rows = 240
cols = 240
X = FltArr(240,240)
OpenR, lun, 'Xdir.csv', /Get_Lun
ReadF, lun, X
Free_Lun, lun
print, X
```

```
rows = 240
cols = 240
Y = FltArr(240,240)
OpenR, lun, 'Ydir.csv', /Get_Lun
ReadF, lun, Y
Free_Lun, lun
print, Y
```

;;;---Interpolate the coordinates---;;;

```
R=sqrt(X^2+Y^2)
Theta=atan(Y/X)*2*!PI
spd1=Polar_Surface(spd, R, Theta)
```

```
unsmooth = CONTOUR(spd1, TITLE='Hurricane Wind Speed', $
```

```
LAYOUT=[2,1,1], RGB_TABLE=13, /FILL, N_LEVELS=12)
```

```
; Draw the outline of the 12 levels
```

```
outline1 = CONTOUR(spdl, N_LEVELS=12, /OVERPLOT)
```

2) I need to then decompose the speed into wavenumbers using a 1D FFT, however I have no idea how to plot these wavenumbers on a similar plot to the polar plot from above.

I need wavenumbers 0-3, the sum of those wavenumbers, and wavenumbers 0-9.

Any assistance is appreciated.

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