

# Analysis Methods in Atmospheric and Oceanic Science

AOSC 652

Fourier Analysis in IDL

Week 9, Day 3

28 Oct 2016

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## What to do with irregularly spaced data?

Or... what is the sampling frequency of the observations are infrequent?

One way to fix this is to interpolate the data to regularly spaced time intervals.

Please copy `~tcanty/AOSC652/2016/WEEK_09/intrp_prac.pro`

Assume your sporadic data begins at `year_begin=521` and ends at `year_end=1972`

1) Create a new time array

```
time_new=year_begin+indgen(year_end-year_begin+1)
```

2) Interpolate to the new time array

```
data_new=interpol(data,time,time_new)
```

3) Let's try something....

Change your time array so it begins and ends outside of the actual time range

Repeat step 2)

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# Inverse FFT

You can take your transformed FFT output and change it from frequency space back to time space.

```
g=fft(sunspot_number)
h=fft(g, /inverse)
```

Why would you want to do this?

# Inverse FFT

You can take your transformed FFT output and change it from frequency space back to time space.

```
g=fft(sunspot_number)
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```

Why would you want to do this?

Sometimes you may wish to focus on either high frequency or low frequency signals (i.e. short term or long term variations in a data set such as a temperature record.

Please have a look at [~tcanty/AOSC652/2016/WEEK\\_09/tone02\\_reverse.pro](#)