Q.

Step 1: is it a PC wave? (what we want)

1) test for coherence

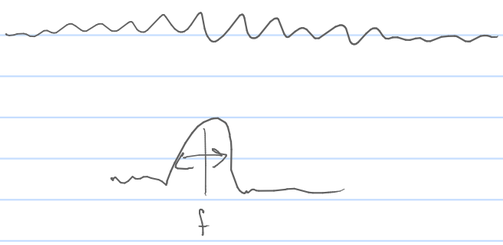
Real-world signal is like a sine wave times ⊓⊓ (window to make it finite)

↳ $P^{ideal}(f) * W(f)$ (convolve, window, Fourier space)

main problem with real world data is that it's finite, but theory is for infinite

time-frequency

as window gets bigger, spread gets smaller



so only get wiggles

window, detrend

option • cross-corr between N, E, Z to determine coherence

↳ could also do other things to measure coherence

visualization of cross-corr on map

1a) model before using data

(Nyquist Δt data - 1 minute

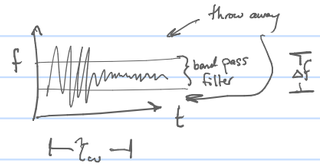
T_{window} - choose to match time scale of overall event

T_{wave} - resolve the wiggles per of osc is much smaller than window time

*optimize timescales - job

2) do we want to filter out everything but the PC wave?

- band pass filter (spectogram)



how to choose Δf & T_w - job

could also do cross-corr

3) coherence measures - between stations

maybe normalize out amplitude and just do coherence on phase

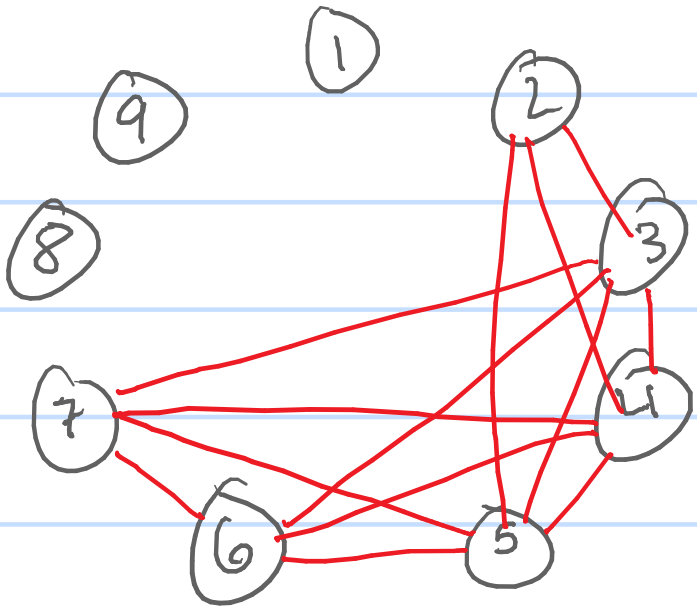
- phase coherence (for PC waves)

4) network (thresholding)

like in paper

maybe it would get rid of the thresholding issues

TEST OUT PHASE CORRELATION



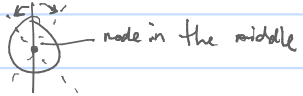
Sum over row & column

Running mean to detrend data (signal)

CCA - uses phase & amplitude

Phase coherence - normalizes amplitude

↳ useful for same longitude -



Visualization about results (phase, etc.)

lag - directed network

eventually, determine clustering (and other network stuff)