



Exploring linkages between time series: Wavelet coherence and phase-aware teleconnections

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Finding linkages between time series can teach us about the underlying dynamics of a complex system. E.g. A statistical link between two time series can be interpreted as one part of the system is forcing another, or that they are responding to the same forcing. A classical statistical measure of the linkage strength is the Pearson correlation coefficient. A stronger test for quasi-period signals requires a consistent phase relationship between the series. The phase relationship can provide additional evidence for the coupling mechanism. Phase-aware teleconnection patterns can be made by extending the phase coherence and relative phase to a spatial grid. This may be useful in e.g. tracking wave propagation. Wavelet coherence expands the coherence concept to time frequency space.