Geophysical Research Abstracts, Vol. 7, 04837, 2005
SRef-ID: 1607-7962/gra/EGU05-A-04837

Application of the cross wavelet transform and wavelet coherence to geophysical time series

A. Grinsted (1,2), J. C. Moore (2) and **S. Jevrejeva** (3)

(1) Arctic Center, University of Lapland, Rovaniemi, Finland;(2) Department of Geophysics, University of Oulu, Oulu, Finland; (3) Proudman Oceanographic Laboratory, Liverpool, UK

We discuss the cross wavelet transform and wavelet coherence for examining relationships in time frequency space between two time series. We demonstrate how phase angle statistics can be used to gain confidence in causal relationships and test mechanistic models of physical relationships between the time series. As an example of typical data where such analyses have proven useful, we apply the methods to the Arctic Oscillation and Southern Oscillation indices and the time series of ice conditions in the Baltic and Barents seas. Monte Carlo methods are used to assess the statistical significance against red noise backgrounds. A software package has been developed that allows users to perform the cross wavelet transform and wavelet coherence (http://www.pol.ac.uk/home/research/waveletcoherence/).