

# IS THERE ANY FREQUENCY DEPENDENT TIME LAG BETWEEN POLAR MOTION AND ITS ATMOSPHERIC EXCITATION?

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Wavelet transform techniques and the Fourier transform band pass filter were applied to compute cross-covariance functions and frequency dependent time lags between complex-valued polar motion and atmospheric excitation functions. These wavelet transform approaches are based on the classical wavelet transform with Morlet wavelet and the harmonic wavelet transform. In this study we concentrate on short period oscillations with periods ranging from several to about 250 days. The maxima of the cross-covariance function modules allow to determine frequency dependent time lags between similar variations occurring in two time series. Since it is difficult to obtain analytic formulae for statistical errors of the cross-covariance and time lag functions the Monte-Carlo experiment on the red noise and surrogate data obtained from the atmospheric and geodetic excitation functions were performed. Such analysis enables the computation of the significance levels of the computed time lags between the atmospheric and geodetic excitation functions.