Determination of the common signal in the geodetic and fluid excitation functions of polar motion using the Wavelet semblance filtering

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The polar motion (geodetic) excitation functions were computed using IERS C04_05 combined pole coordinates data. The fluid excitation functions comprise the sum of the equatorial components of atmospheric angular momentum from the NCEP/NCAR reanalysis data and ocean angular momentum assimilating global ocean circulation model ECCO/JPL.

Next, the geodetic and fluid excitation functions were transformed into time-scale domain using the discrete wavelet transform based on the Shannon wavelet functions.

Such a decomposition enables computation of the semblance functions between the wavelet transform coefficients of the considered time series. For a fixed semblance threshold selected from the set of wavelet transform coefficients which exceeded the threshold the average of two time series wavelet transform coefficients were computed. Zero values were assigned to wavelet transform coefficients for which the semblance was below the threshold. The common signal in the considered time series is then computed using the inverse discrete wavelet transform.