UDC 721

FILTRATION SYSTEMS MANAGEMENT INFORMATION CHANNELS BIOTECHNICAL OBJECTS

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Analyzes prerequisites using Hilbert transform-Huang for cleaning information signals from noise, investigated various ways of implementing Hilbert-Huang transform.

Filtering, channel information, noisy, prediction.

Traditional methods of data analysis designed typically for linear and stationary signals and systems. However it is clear that many information channels of special purpose not meet the following initial requirements, however, while filtering is a prerequisite for further data processing. So OK, Huang Hilbert transform (HHT), which is defined as a method of time-frequency analysis based on empirical modal decomposition (EMD) nonlinear and non-stationary processes and Hilbert spectral analysis (HSA).

The purpose of research - to study the basic methods of implementation Hilbert-Huang transform in the context of information filtering signals.

Overall EMD method is based on the assumption that any data set contains various modes of oscillatory processes. Each of these vibrational modes can be represented by a function of domestic fashion (IMF) with the restrictions: the number of extrema and the number of zero-crossing function should be equal or differ by no more than one; at any point average value function envelope curves defined local extremes should be 0.

To cut the Boundary forward filtered signal and calculate the angle difference of the input signal. This maximum angle to the first window and gradually decreases with increasing shear box calculation of the signal. But the decrease in uneven and limits of information slows down due to statistical noise resistance dropout and low dependence on filters and width limits their transition zones.

Slowing down can zafiksovaty for local minimumumom derivative changing the angle of divergence.

Thus, we have set a limit cutting; the upper limit of complete suppression of high-frequency components of the filter - the same.

To cut the Boundary forward filtered signal and calculate the angle difference of the input signal and accepted that cleaning of noise time series of solar radiation will require four-dropout noise, ie the formation of IMF-1 = IMF1a + IMF1b + IMF1c + IMF1d (Fig. 1). Denormuvavshy filtered signal, set the amount of noise in the input signaling components 23.762% (Fig. 1).

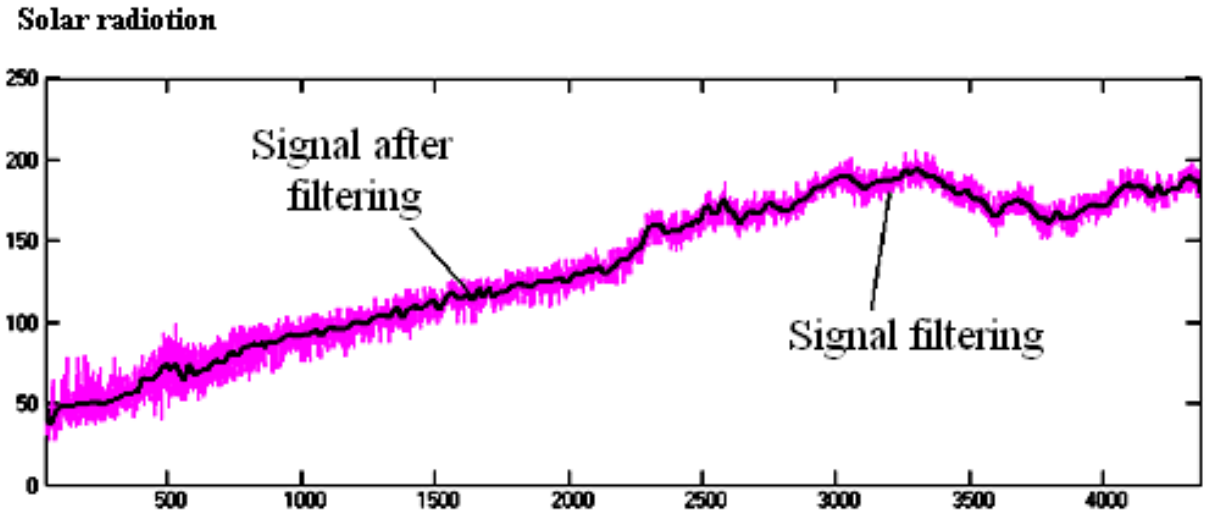

Fig. 1. Overlay of input signal and the filtered time series of solar radiation

Conclusions

1. Given the proven efficiency and relatively simple software implementation, mathematical filter based on Hilbert-Huang transform should be used for analysis (filtering) of information channels for special purposes.

2. Among the list of known ways to implement the Hilbert-Huang transform, the most convenient for the practical use, there is a way that is based on the formation of a frequency domain transfer function H low-pass filter with a cutoff frequency upper limit according to early high noise.