# Effectiveness of Empirical Mode Decomposition in Search for Gravitational Wave Signals

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- In order to examine properties of time series data, traditionally the Fourier transform, the wavelet transform, etc. are used.
  But they can applied only to a stationary and/or linear data.
- On the other hand, by means of the Hilbert spectral analysis, we can investigate time evolution of characteristics of waves, including instantaneous amplitudes and frequencies.
- However, the Hilbert transform is not usually applicable for real, physical data including noise.

- Recently, Huang proposed the Empirical Mode Decomposition (EMD) technique followed by the Hilbert transform to detect and characterize physical oscillatory modes of noisy data.
  We call it the Hilbert-Huang Transform (HHT).
- HHT can be applied to non-linear and non-stationary time series data.
- HHT has been applied to various fields; biomedical engineering, financial engineering, image processing, seismic studies, ocean engineering, etc.

- We are investigating applicability of HHT to search for gravitational wave signal.