

Quantile Coherence Analysis: Application to Precipitation Data

Authors : Yaeji Lim, Hee-Seok Oh

Abstract : The coherence analysis measures the linear time-invariant relationship between two data sets and has been studied various fields such as signal processing, engineering, and medical science. However classical coherence analysis tends to be sensitive to outliers and focuses only on mean relationship. In this paper, we generalized cross periodogram to quantile cross periodogram and provide richer inter-relationship between two data sets. This is a general version of Laplace cross periodogram. We prove its asymptotic distribution under the long range process and compare them with ordinary coherence through numerical examples. We also present real data example to confirm the usefulness of quantile coherence analysis.

Keywords : coherence, cross periodogram, spectrum, quantile

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