



Use of the Box-Cox Transformation in Detecting Changepoints in Daily Precipitation Data Series

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This study integrates a Box-Cox power transformation procedure into two statistical tests for detecting change-points in Gaussian data series, to make the changepoint detection methods applicable to non-Gaussian data series, such as daily precipitation amounts. The detection power aspects of transformed methods in a common trend two-phase regression setting are assessed by Monte Carlo simulations for data of a log-normal or Gamma distribution. The results show that the transformed methods have increased the power of detection, in comparison with the corresponding original (untransformed) methods. The transformed data much better approximate to a Gaussian distribution. As an example of application, the new methods are applied to a series of daily precipitation amounts recorded at a station in Canada, showing satisfactory detection power.