



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics

MASTER'S THESIS PRESENTATION

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Estimating Long-Range Dependence in Central England  
Temperature

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Jones 304, 5747 S. Ellis Avenue

#### ABSTRACT

We analyze the central England temperature from January 1772 to December 2016 to investigate the long-range dependence. A number of time domain and frequency domain methods are applied to the temperature data for the estimation of the Hurst exponent, an index which measures the strength of long-range dependence. The time series used for estimation are monthly mean temperature with the denominating annual cycle removed. We find that the estimation results of all the methods suggest the existence of long-range dependence in central England temperature. Most of the Hurst exponent estimates are around 0.7. Uncertain quantifications such as standard error and 95% confidence interval are provided for Whittle method, chisquare-MLE and Log-periodogram Regression.

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