



The University of Chicago  
Department of Statistics

PhD Dissertation Proposal Presentation

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**XIAOHUI CHANG**

Department of Statistics  
The University of Chicago

**Wavelet Analysis in Spatial Interpolation  
of High Frequency Monitoring Data**

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**ABSTRACT**

Fourier analysis of spatial temporal data has the difficulty of capturing and explaining infrequent local changes that are often observed in meteorological data. We propose a novel approach based on wavelet analysis to explain the sudden but strong local changes seen in a high frequency monitoring dataset, also hoping that the covariance structure of data after wavelet transform is simpler and easier to analyze.

The data were collected through the Atmospheric Radiation Measurement program and it includes minute by minute measurement of many meteorological variables. Under a parametric framework, our “Simple Scale Model” does just as well as more complicated models using Fourier analysis.

In order to capture the asymmetry pattern that is usually associated with climate related data, more elaborate models are also proposed.