

Application of Time Series Methods to Air Quality Data  
Philip K. Hopke  
Center for Air Resources Engineering and Science  
Clarkson University

This course will provide an introduction to time series analyses of air quality data. Such analyses can be used to understand the underlying causative factors for collected data or to use existing data to forecast future behavior. There are a wide variety of available tools and their applicability and limitations of the various methods will be presented. Examples of the application of various methods will be provided.

Introduction

- Stationarity
- Explication
- Forecasting

Data Preparation

- Data quality
- Outlier detection
- Transformation

Trends

- Parametric –
  - Regression
    - Continuous
    - Piece-wise
- Non-Parametric -
  - Kendall-Mann analysis with Sen's Slope

Frequency Analysis

- Detrending
- Autocorrelation
- Cross-Correlation
- Fourier Transform

Forecasting

Software for performing these analyses will be provided as part of the course.