Space-Time Analysis of Mexico City Ozone Levels

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Abstract

We consider hourly readings of ozone concentrations over Mexico City and propose a model for spatial as well as temporal interpolation and prediction. The model is based on regressing the observed readings on air temperature. A few harmonic components are added to account for the main periodicities that ozone presents during a given day. The model incorporates spatial covariance structure for the observations and the parameters that define the harmonic components. Using the state-space framework, we show how to compute smoothed means and predictive values. The methodology is illustrated using observations from September 1997.

Key Words: Ground-level Ozone; Spatio-temporal models; State-space models; Variogram; Bayesian inference, Smoothing, MCMC.

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Air pollution problem in Mexico City