

Modeling Air Quality in the Tuscany Region: the NO-NO₂ Case

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Abstract: We focus on bivariate spatial modelling of the annual means of nitrogen oxide and dioxide in the Tuscany region for 2003, 2004 and 2005 years. Spatial prediction of NO and NO₂ and associated uncertainty are crucial for policy agency to make assessment and planning. The two pollutants under investigation are correlated among themselves, because the most of nitrogen dioxide in atmosphere is originated from the NO directly emitted from the sources. We use a general template of multivariate spatial hierarchical bayesian model developed in Finley et al. to test and compare different model hypothesis. We explore different correlation structures, both separable and not, to choose the best fit model and discuss the results.

Keywords: Air pollution; Bayesian inference; Coregionalization; Multivariate spatial process.