



The University of Chicago  
Department of Statistics  
Seminars for Fourth Year PhD Students

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**Statistical Properties on Error  
of the Air Pollution Model**

**MONDAY, November 14, 2005 at 2:30 pm  
110 Eckhart Hall, 5734 S. University Avenue**

**ABSTRACT**

The difficulty in assessing errors in numerical models is a major obstacle to improving the ability to predict air quality. There are many different sources of errors in the numerical air quality models. Our goal is to understand the statistical behavior of model errors and to get quantitative statistical description of them. It will hopefully lead to more accurate predictions of air quality. We have simulation outputs at different resolutions, using the CMAQ, a numerical air quality model used by the US Environmental Protection Agency (EPA). With these simulations, we have focused on the errors due to different resolutions. We plan to show some preliminary findings. However, it is not possible to know the 'true state' of the complicated numerical model in an explicit way. Thus, we employ a plume model which is much simpler, and whose exact solution is known. The plume model is an advection-diffusion equation with discrete point sources. We assume multiple random point sources, and investigate the behavior of errors between the analytic solution and the numerical approximation. Although this model is much simpler than a model like CMAQ, we believe that it will give us insight into model errors.

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