

Analyses of Emission Datasets Used in Global and Regional Chemical Transport Models

Lin, J.-T.¹, D. Wuebbles¹, K. Patten¹, A. Williams², H.-C. Huang², M. Caughey² and Z.-N. Tao²

¹ Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, IL

² Illinois State Water Survey, IL

Abstract

Global and regional chemical transport models (CTMs) are being used to study the air quality problem over different spatial scales from global to regional. We are examining the coupling between such models to investigate the interaction between localized emissions and pollutant transport for the studies of the relationships between climate change and local air quality. In our project, the Model for Ozone And Related chemical Tracers version 2 (MOZART2) and the Air Quality Model (AQM) are being used to simulate the impacts of global climate and emission changes on the U.S. air quality. MOZART2 is used to provide boundary conditions for the regional model studies and thus provides the effects of long-range transport of pollutants into the regional scale studies. These models use greatly different emission inputs, the Emission Database for Global Atmospheric Research (EDGAR, updated version) in MOZART2 and the Environmental Protection Agency (EPA) National Emission Inventory-99 (NEI99) in AQM. Here a series of calculations will be presented, in which the effects of both emission datasets are compared in the global model. Two model results (MOZART2 with EDGAR and MOZART2 with NEI99) are compared. In the model analyses, the focus species are ozone, CO, NO_x and non methane VOCs; the focus period is summer, while the focus locations are New York (northeast), Chicago (Midwest), Los Angeles (California), Seattle (Northwest) and a background site (46.42N,-105E).