



Regional Air Quality in the Vicinity of São Paulo Megacity: pollution and health effects

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The transport of pollutants among urban area and their interactions concern an issue in air quality modeling. According to the study performed by Sanchez-Ccoyllo et al., 2006, higher ozone concentrations and particulate matter were found in days when the Metropolitan Area of Sao Paulo, MASP is under circulation of winds from the northeast part of the state to the center of the city. In the northeast of state is localized the Paraíba Valley, which is an industrialized region. Therefore, forecast air quality is important to understand physical and chemistry processes that happen in the atmosphere and to help in the formulation of control strategies to reduce the pollution and consequently the health problems associated. The Weather Regional Forecast Chemical model (WRF-chem) treat the chemical (gas and aerosol) and meteorological on-line and has been used to study the regional air quality of São Paulo megacity and their implications in human health. The great problem associated to the application of models for South American is the lack of adequate emission inventory. Therefore a great effort has been done to provide information for the air quality model. Different periods with meteorological and chemical conditions were simulated to evaluate the performance of model. Temperature, humidity, CO, NO_x, PM₁₀, O₃ (surface and vertical) data were used to validate the model at the first phase of work. The comparison of ozone concentrations simulated and observed in surface showed a correlation coefficient from 0.67 to 0.75 for different air quality stations. Also the vertical ozone profile was in agreement with observations. The region of study (-53.2 to -41.0 and -26.3 to -19.7) has about 57 percentage of Brazilian fleet. Therefore, it is crucial to have studies concerning the forecast of air quality and their health effects, which are being developed.