NUMERICAL MODELLING OF AIR POLLUTION ON REGIONAL AND LOCAL SCALES

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Abstract

The development and application of numerical regional and local chemistry transport models (CTMs) is discussed. Introductory remarks address the motivation for the employment of these models in atmospheric and environmental sciences. Furthermore, it is stated that there is a strong need for application of CTMs to environmental policy and planning and air quality forecasts as an important factor for the reduction of health risks. The fundamentals of CTM design are addressed, thereby emphasizing the necessity of grid adaptation in regional models for the treatment of smaller scale and local air pollution problems. Going to very high resolution it is convenient to couple regional models with models especially designed for specific local conditions. An example of such a model chain is the planned coupling of the European Air Pollution Dispersion model system (EURAD) with the Tbilisi Air Pollution model (TAP). Practical aspects of the treatment of boundary and initial conditions are discussed. Examples of model applications are given exploiting the experience gained with the EURAD system. Model evaluation studies have not been included in the paper, but it is emphasized that they are an important and demanding part of air pollution model development and application.

Key words and phrases: Decomposition method, Operator split, Semigroup, Trotter formula, Cauchy abstract problem, Rational approximation.

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