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Bulgarian emergency responce system for release of hazardous pollutants - design and first test of the preparedness mode

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The NATO SfP N 981393 project aims at developing of a unified Balkan region oriented modelling system for operational response to accidental releases of harmful gases in the atmosphere, which would be able to:
1.Perform highly acurate and reliable risk analysis and assessment for selected “hot spots”;
2.Support the emergency fast decisions with short-term regional scale forecast of the propagation of harmful gas-esin case of accidental release;
3.Perform, in an off-line mode, a more detailed and comprehensive analysis of the possible longer-term impacts on the environment and human health and make the results available to the authorities and the public.
The present paper describes the set up and the testing of the system, mainly focusing on the risk analysis mode.
The modeling tool used in the system is the US EPA Models-3 System: WRF, CMAQ and SMOKE (partly). The CB05 toxic chemical mechanism, including chlorine reactions, is employed. The emission input exploits the high-resolution TNO emission inventory. The meteorological pre-processor WRF is driven by NCAR Final Reanalysis data and performs calculations in 3 nested domains, covering respectively the regions of South-Eastern Europe, Bulgaria, and the area surrounding the particular site.
The risk assessment for the region of „Vereja Him“ factory, Jambol, Bulgaria is performed on the basis of one-year long model calculations. The calculations with CMAQ chemical transport model are performed for the two inner domains. An ammount of 25 tons of chlorine is released two times daily in the innermost domain, and seprate calculations are performed for every release.
The results are averaged over one year in order to evaluate the probability of exceeding some regulatory treshold value in each grid point.
The completion of this task in a relatively short period of time was made possible by using the newly developed Grid computational environment, which allows for shared use of facilities in the research community.