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Simulation of ozone production in a complex circulation region using nested grids

M. Taghavi, S. Cautenet, and G. Foret

Laboratoire de Météorologie Physique, OPGC-CNRS and Université Blaise Pascal, Aubière, France

Abstract. During the ESCOMPTE precampaign (summer 2000, over Southern France), a 3-day period of intensive observation (IOP0), associated with ozone peaks, has been simulated. The comprehensive RAMS model, version 4.3, coupled on-line with a chemical module including 29 species, is used to follow the chemistry of the polluted zone. This efficient but time consuming method can be used because the code is installed on a parallel computer, the SGI 3800. Two runs are performed: run 1 with a single grid and run 2 with two nested grids. The simulated fields of ozone, carbon monoxide, nitrogen oxides and sulfur dioxide are compared with aircraft and surface station measurements. The 2-grid run looks substantially better than the run with one grid because the former takes the outer pollutants into account. This on-line method helps to satisfactorily retrieve the chemical species redistribution and to explain the impact of dynamics on this redistribution.

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