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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The impact of a deep convection on sulfate transport and redistribution" *by* V. Spiridonov and M. Curic

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We are acknowledged Mis. Marija Andreevska for her constructive and usful coments. The statement that cloud-chemistry modeling is a novel aspect of investigating that issue in Macedonia is quite correct.

1. The term for nucleation scavenging (PS3) simply models the primary activation of cloud condensation nuclei (CCN). The nucleation efficiency indicate that 80%-100% of the total aerosol mass is activated and incorporated into cloud drops when there is a condensation. According Taylor [1989b] this process is parameterized using

PS3= (eSO4xqSO4)/dt for dq $>$ 0. PS3= 0 FOR sq $<$ or =0. .

where eSO4=0.55 is the fractional nucleation efficiency, dt is the current time step, and dq is the condensation of cloud drops during the current time step. The condensation rate for cloud water is denoted by and is calculated as the difference between total

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cloud water at a grid point prior to the temperature adjustment required to bring the water fields and energy into equilibrium after advection, and after the temperature adjustment step. The similar approach is applied for the ice nucleation scavenging of . The (PS5) models the primary activation of ice condensation nuclei (IN) but this term has no significant importance in parameterization scheme and could be neglected.

2. Again we would like to clarify this misunderstanding. Values shown in Table 6, above those given in parentheses, delineate the maximum calculated values in the entire integration model domain. There are not smoothed or filtered values and we have to remove them in order to eliminate eventual misunderstanding. As has been seen from above table, the maximum calculated cloud water and rainwater pH are 6.5 and 7.0 respectively, and gradually decrease towards identical pH =5.5 in 60 min of the simulation time. However authors suggest to referee to reconsider the statement on page 402 line 8 (Lower calculated value of pH .....).

3. In regard to Section 4.3 and the question about the atmospheric sounding and initialization of the chemical fields for the second analyzed case, we shall complete this Section, in the revised manuscript presenting the both initial data (meteorological+chemical).

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 385, 2002.