

Interactive comment on “Technical Note: an implementation of the dry removal processes DRY DEPosition and SEDimentation in the Modular Earth Submodel System (MESSy)” by A. Kerkweg et al.

Anonymous Referee #1

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Referee Report for the manuscript:

Technical Note: an implementation of the dry removal processes DRY DEPosition and SEDimentation in the Modular Earth Submodel System (MESSy) by A. Kerkweg, J. Buchholz, L. Ganzeveld, A. Pozzer, H. Tost, and P. Jöckel

I suggest to publish the paper in ACP after some modifications which are discussed in the following.

General comments

The authors present a detailed description of the MESSy submodules DRYDEP and SEDI including the parameterizations used. The paper is well written, I very much appreciate such a detailed model documentation. My only major concern is about potentially redundant documentation: my first impression is, that DRYDEP, OFFLEM and ONLEM (Kerkweg et al., ACPD) and EMDEP (Ganzeveld et al., ACPD) are virtually doing the same. If so, it might be an good idea to combine these three papers into two documentations, one for emissions and another one for dry deposition. If not, what are the basic differences between DRYDEP/OFFLEM/ONLEM and EMDEP? If you do not like the idea of only two instead of three documentations, I would like to get an answer on the question which modules should be used by a MESSy user. Are there any recommendations for specific applications? What are the advantages and disadvantages of both approaches?

Specific comments

p. 6856, line 16: I suggest to give references for ECHAM3 (DKRZ, 1992) and ECHAM4 (Roeckner, 1996) in addition to the URL.

p. 6858, line 10: no unit is given for the friction velocity u^*,t

p. 6861, line 14: Why do you use the mass mean diameter instead of the mass median diameter? Isn't this inconsistent with the use of the number median diameter? Please give an additional sentence on your motivation or a reference.

p. 6863, Eq. 17: Please do not use italics for "ln".

p. 6874, line 18: Please motivate your additional assumptions on the prescribed roughness lengths. Why is the roughness length limited to a minimum value of 0.005/0.02 although this seems not the case in the base model?

p. 6881, Eq. A21: Please write 10^5 instead of 1.e5.

p. 6882, line 1: What do you mean by "as above"? Equation A1?

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p. 6882, Eq. B3: Replace the centered dot (multiplication sign) by the cross used in all other equations.

p. 6882, Eq. B7/line 17: I assume λ_p should be λ_{air} as in Eq. 16?

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 6853, 2006.

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