

Interactive comment on “Cn to ccn relationships and cloud microphysical properties in different air masses at a free tropospheric site” by R. Dupuy et al.

Anonymous Referee #2

Received and published: 28 February 2006

Review of ACPD MS “Cn to ccn relationships and cloud microphysical properties in different air masses at a free tropospheric site” by R. Dupuy, P. Lay and K. Sellegri

The MS contains interesting data that deserve publication within the scope of ACP. Some of the conclusions reached in the MS, however, cannot adequately be judged based on the information given in the MS. The reviewer therefore recommends major revisions of the MS before final acceptance by ACP.

For highly relevant quantitative experimental details, the reader is referred to earlier publications. Although not everything has to be repeated every time a new aspect of a

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field campaign is published, the most relevant information should be given also in this MS so it can be read as a stand-alone paper.

Details on cut sizes of the impactors and the CN counter (TSI 3010) must be added also to this MS. Without knowledge of the lower cut size of the CN counter, the CCN/CN data cannot be put in context. Readers of a scientific paper should not be required to look up data sheets of commercial instruments. This lack is especially grave in the comparison between PDD and ACE-II data. If the CN counters used in the different studies have different lower cut points, the difference in CCN fraction may disappear (or be even larger than stated here).

The term CCN is used for activated cloud droplets, which is certainly permissible, but the authors should include a sentence saying that this is a different definition from the one most widely used (droplets formed at a certain supersaturation in a CCN counter). CCN fractions obtained from measurements of actual cloud droplets (this MS) and from measurements with CCN counters (publications by other groups) need not be directly comparable.

The classification of air masses according to particle number concentration is also described in the companion papers - please give a short justification here. What averaging times are used to arrive at a classification of a specific cloud event?

Please also define the term “RJI inlet” - the definition is absent in the MS.

What was the reason to present the chemical composition of the bulk aerosol instead of separating the size range of the impactors into “fine” and “coarse” and show the chemical composition of these two size fractions? For CCN studies, the composition of the fine fraction is much more interesting than that of the coarse fraction.

For the interpretation of the differences between cloud events belonging to the different categories, information of number and duration of cloud events of which LWC in each class would be needed. This information is absent from the MS, but should be added.

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Some additional technical corrections should be made (a further round of editing for typos and small grammatical inconsistencies is recommended).

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 879, 2006.

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