

Interactive comment on “Cloud detection and classification based on MAX-DOAS observations” by T. Wagner et al.

Anonymous Referee #2

Received and published: 20 February 2014

The paper by Wagner et al. gives a very thorough overview on the possible impact of clouds on MAX-DOAS observations. The study also introduces a cloud detection and classification algorithm using typical quantities derived from MAX-DOAS observations like the column of the oxygen dimer O₄ or the radiance ratio at two selected wavelengths (colour index). Some of the findings and also some concepts and ideas have been already published in recent studies, but never in such a comprehensive way like here. Since the presence of clouds is one of the major uncertainties for all studies using MAX-DOAS data the paper is well-suited for the publication in AMT. The authors should address for some minor revisions/corrections as detailed below.

Detailed comments:

C4466

- p10301, 2.1: Please introduce CI before using.
- p10302 2.2: Please explain why asymmetry parameters of 0.68 and 0.85 have been chosen or a give a reference to another study supporting these assumptions.
- p10303 2.3 Why the authors have not used backscatter lidar measurements which have been carried out during CINDI to further (and better) characterize the selected days? This information might be very useful to further prove some of the statements in section 3.1..
- p10306,15: “most probable reason for the discrepancy is the neglect of polarization in our radiative transfer model”, please explain in more detail or again give a reference to a study supporting this hypothesis.
- p10311 I3: $1.3 \cdot 10^{43}$ molec²/cm⁵ sounds like a very small number for the VCD for normal conditions. How this number was calculated? Do the authors have any idea why for this study no scaling factor is needed to get an agreement between modelled data and observations?
- p10314 I25, “non-ambiguous”, better: more apparent . . .
- Table 1 and Figures 1 to 5, 15, 17: I would prefer to have the days in a temporal order instead of this arbitrary selection.
- Figure 13: “indictor” indicator

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 10297, 2013.

C4467