**Atmospheric
Chemistry
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Discussions**

Interactive
Comment

Interactive comment on "FRESCO+: an improved O$_2$ A-band cloud retrieval algorithm for tropospheric trace gas retrievals" *by* P. Wang et al.

Anonymous Referee #2

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This manuscript describes an improved cloud retrieval algorithm for tropospheric trace gas retrievals. The new cloud algorithm includes single Rayleigh scattering. A thorough comparison is presented between the new (FRESCO+) and the old (FRESCO) algorithm. The FRESCO+ results are compared with ground-based radar/lidar measurements. Implications are examined for the effect of FRESCO+ on retrievals of NO2 and O3. An improvement is found versus ground-based measurements of NO2 as part of the DANDELIONS campaign. This is an excellent manuscript. I recommend publication after addressing a few comments below.

The comparison to ground-based radar/lidar measurements only includes FRESCO+. Including FRESCO in the comparison would provide information on the degree of improvement from FRESCO to FRESCO+.

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Section 3.2 and the caption of Figure 4 note that snow/ice pixels are not included in the distributions. It would be helpful to add a brief comment in the text about the behavior of FRESCO+ over snow/ice.

p. 9708, line 16: add "above-cloud" before AMF

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 9697, 2008.