Interactive comment on “A cloud algorithm based on the O$_2$-O$_2$ 477 nm absorption band featuring an advanced spectral fitting method and the use of surface geometry-dependent Lambertian-equivalent reflectivity” by Alexander Vasilkov et al.

Anonymous Referee #1

Received and published: 5 May 2018

General comments:

This paper presents a cloud retrieval algorithm using the O$_2$-O$_2$ absorption feature centered at 477nm. I am impressed by the detailed description of the algorithm and the results. The paper is well written and relevant to the community. I recommend publication after addressing the minor issues listed below:

A general question I have is how to use this algorithm independently. As stated in the paper, the retrieved cloud information is intended for the NO2 retrieval for OMI and TEMPO mission, yet the cloud algorithm needs NO2 info for the fitting process. Isn’t that a paradox? OMI has the NO2, O3, and H2O retrievals from independent retrieval algorithms for the fitting process described in this paper; will TEMPO also have these trace gas retrievals as input to this cloud algorithm?

Specific comments:

Page 2, Line 5-6: “Other cloud parameters include the cloud phase, the cloud particle shape, and the particle size distribution that determine the cloud phase scattering function” is not a full sentence. I guess you want to say these parameter are not considered.