Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2018-94-RC2, 2018

Atmospheric Measurement Techniques Discussions

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 #2

Received and published: 18 May 2018

This study presents an improved cloud algorithm based on the O2-O2 collision band around 477 nm, which is intended to be used for OMI and TEMPO NO2 retrieval algorithm. The improvements include a new spectral fitting approach to derive O2-O2 SCDs and the use of geometry-dependent LER (GLER) to replace climatological LER assumption. The new algorithm are clearly described in the context of retrieving NO2 from. The performance of the new algorithm is throughly evaluated by comparing retrieved effective cloud fraction (ECF) and cloud pressure (OCP) with OMI standard

algorithms. Authors also compared the retrieved ECF and OCP between the uses of GLER versus climatological LER. The results are well presented and discussed. This is overall an excellent piece of work. I only have a couple of following comments.

First, while the detailed steps of the spectral fitting and cloud algorithms (section 2.2-2.3) are well describe, I still feel difficult to follow. So, I would suggest add a flowchart of algorithm procedures, which will help readers better follow the text.

Second, (page 8, line 25) what's the reason for higher OCP retrievals based on your algorithm? I assume it is because different spectral wavelengths are used. But is that also related to the definition of cloud pressure (e.g., OMCLDO2 uses cloud top pressure?)?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-94, 2018.