

Atmos. Meas. Tech. Discuss., referee comment RC1  
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## Comment on amt-2022-156

Anonymous Referee #1

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Referee comment on "Algorithm theoretical basis for ozone and sulfur dioxide retrievals from DSCOVR EPIC" by Xinzhou Huang and Kai Yang, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-156-RC1>, 2022

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### General comments

This paper presents the algorithm details employed for retrieving total columns of O<sub>3</sub> and SO<sub>2</sub> from DSCOVR EPIC UV measurements with the direct vertical column fitting method. The paper is well structured and written. For general readers, the author kindly describes the radiative transfer process of incoming UV photons and forward model calculations along with the comprehensive sensitivity tests. The inverse process from spectral measurements and geophysical variables are specified with error analysis. And then, retrievals are validated using brewer measurements/MERRA-2 for O<sub>3</sub> and OMPS products for SO<sub>2</sub>. I agree with the conclusion of this paper, the maturity level of the presented algorithm is very high and the EPIC hourly measurements are very promising.

I would like to recommend this article for the publication of ATM after revising several minor aspects.

### Minor comments

- I think that this article is a good textbook for students who just step into the atmospheric remote sensing area. But, this manuscript needs to be tightened in the format of research article, especially for section 2.
- Section 7.1: have you any suspects about distinct scatters/less correction between EPIC O<sub>3</sub> and brewer at Paramaribo compared to other stations? I am wondering if it comes from either Brewer measurement uncertainties or algorithm retrieval artifacts in tropics. You should check this issue by performing the additional evaluation at stations adjacent to Paramaribo.

