Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2018-148-RC2, 2018

Atmospheric Measurement Techniques Discussions

Interactive comment on "Stratosphere-troposphere separation of nitrogen dioxide columns from the TEMPO geostationary satellite instrument" *by* Jeffrey A. Geddes et al.

Anonymous Referee #2

Received and published: 25 September 2018

The paper describes the adaptation of a stratosphere/troposphere separation algorithm to the upcoming geostationary satellite instrument TEMPO. It is well written, logically structured and convincing in its conclusions. The paper should be published on AMT after dealing with the following issues:

General comments:

1. Gridding approach

The authors perform a gridding as very first step (page 5, line 29). This is not optimal, as satellite pixels with potentially very different conditions (i.e. a low total column over a clouded pixel next to a high total column over a power plant stack without clouds, both

within the same 0.1° grid box) are just averaged, with consequences hard to foresee due to the many nonlinearities involved. I would like to encourage the authors to rethink this approach and go for a different order, i.e. applying the filter on Strop,prior and the masking of pixels high ratio of strat vs trop AMF on individual satellite pixels rather than averaged 0.1° grid pixels.

2. Tropospheric columns

Please provide some information on the frequency distribution of tropospheric columns over remote regions. Do negative columns occur? How large and how variable is the tropospheric column at the edges of the TEMPO domain?

Minor issues

- after introducing LEO on page 1, line 19, please use it (e.g. page 2, line 9; page 3, line 1).

- please comment which STS algorithm is foreseen for operational processing of TEMPO.

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