

Interactive comment on “Intercomparison of MAX-DOAS Vertical Profile Retrieval Algorithms: Studies using Synthetic Data” *by* Udo Frieß et al.

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We thank Referee #1 for his positive comments on our manuscript. We reply to the individual comments point by point, with the original comments shown in *italic*, our replies in roman, and changes to the manuscript in **bold**.

p. 22, l. 2: Which sensitivity studies, reference?

These were internal unpublished studies performed at BIRA, during which the stability of the profile retrieval has been tested using either a Gauss-Newton or a Levenberg-Marquardt inversion scheme. They were motivated by the lack of convergence for some of the scenarios within this synthetic study. We feel that it is beyond the scope of this paper to investigate the internal details of the implementations of the individual

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algorithms and would therefore rather not elaborate this in more detail. a modification of the inversion scheme within bePRO is not foreseen since bePRO will be replaced by the new MMF algorithm in the future.

p.29, fig 16, l. 3: ... as blue vertical line → ... as blue horizontal line

Done

p.31, l. 4: discrepancies are mainly occur → discrepancies mainly occur

Done

p.36, l. 4: between retrieved and atmospheric state

This has been replaced by **between the retrieved atmospheric state from the different algorithms.**

p.36, l. 10: ... have shown ...

p.36, l. 13: About 54% of the data ...

Done

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-423, 2018.

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