

Interactive comment on “TomoSim: a tomographic simulator for DOAS” by Rui Valente de Almeida et al.

Anonymous Referee #2

Received and published: 27 May 2020

This manuscript presents a clear overview of the background required to understand DOAS tomography applications. Bringing sufficient references respectively about tomography and DOAS techniques, this study shows results of synthetic tomography applied for a scene of application (use of drone to operate UV-vis spectroscopy and imaging of trace gas plume).

This manuscript represents a fair contribution to scientific progress in the development of miniaturized DOAS tomographic atmospheric evaluation device and remote sensing of trace gas. The tomographic simulator for DOAS is validated. A real application of the proposed DOAS tomography technique will face problems that are not addressed in this manuscript. Such problem can be considered out of the scope of this study however this brings it to a lower level of scientific significance.

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Discussion paper



The approaches and applied methods proposed are good. A nice overview about tomography and DOAS techniques is presented (with relevant references).

The manuscript is clearly understandable for non-expert in tomography or in DOAS technique. However, this can be improved by providing more information in some of the captions and modified one of the illustration. The scientific results and conclusions are clear, concise, and well structured. More information could be added in my opinion (see comment bellow).

I suggest some technical corrections (minor revision) before this manuscript can be published:

p.10, l.32-33: a positioning precision under 20 cm can be obtained with RTK-GPS when measurements are taken in good condition. This should certainly be mentioned that severe meteorological and space weather situation can degrade NRT position to a precision over 20 cm. p.17, Table 2: in order to see the limitation of FBP it could be interesting to see results for projection interval of 4 and 5 degrees in this table. Thanks to specify if fan beam projection provide same results than parallel scans. p.17, l1-2: some comments on the results of table 2 should be presented here. p.18, caption Figure 11: Thanks to specify which methods is used to show this degradation between 1 to 3 degrees projection intervals reconstructions. p.19: AS an element of discussion in this conclusion, it could be good to know what the author are planning. Do they plan to develop measurements with several drone acting simultaneously or with subsequent acquisition? The issue with time sampling might bring uncertainty and degrade the quality of 2D- and 3D-reconstructions.

I thank the authors for this nice work and hope nice results will be obtained in future near real-time (NRT) applications.

Best regards

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-26, 2020.