

Atmos. Meas. Tech. Discuss., author comment AC1
<https://doi.org/10.5194/amt-2021-152-AC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Reply on RC1

Alberto Sorrentino et al.

Author comment on "A Bayesian parametric approach to the retrieval of the atmospheric number size distribution from lidar data" by Alberto Sorrentino et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-152-AC1>, 2021

We thank the reviewer for their comments, we will modify the manuscript in order to take them into account.

In the meantime, here are a few thoughts on the main points raised.

Regarding point (1) and (3) - i.e. the fact that the refractive index and the number of modes must be known a priori - we are working at a generalization of the method where these variables are estimated from the data as well. However, we thought the method in its current version is already interesting. The title can be modified to account for these limitations.

The log-normal assumption (point 2) is used in many studies; we think it is a reasonable compromise that allows to make the inverse problem less ill-posed.

Regarding point (4), r_{\min} and r_{\max} need to be known but we use quite large intervals; the main idea is to avoid superposition of the means, i.e. to look for modes in different intervals when multiple modes are sought.

We totally agree with point (5), a 5% of standard deviation is too small in general; however, as the method applies to a single set of optical parameters, this can be obtained by averaging (either in time or space, or both).