Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2020-857-RC1, 2020

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Atmospheric Boundary Layer height estimation from aerosol lidar: a new approach based on morphological image processing techniques" *by* Gemine Vivone et al.

Anonymous Referee #1

Received and published: 21 October 2020

The paper entitled "Atmospheric Boundary Layer height estimation from aerosol lidar: a new approach based on morphological image processing techniques" approaches a new methodology to estimate the ABLH from the image/signal processing. The paper is innovative and presents an interesting solution to ABLH detection from elastic lidar/ceilometer data. In the clear sky and convective situations, the algorithm proposed has good results, however in complex or stable situations (e.g. presence of decoupled aerosol layers) the algorithm does not find the same performance.

General Questions:

Performing a separation between the different sublayers of ABLH (Convective Bound-

ary Layer, Residual Layer, Stable Layer, etc.) and then compare how the method behaves when estimating each one can generate better results. Especially during the night.

If Canny's edge detector of other computational languages is applied, is it possible to find the same results? Thinking about the dissemination of this algorithm in other researches centers, an open-source library can be a better solution.

Considering the overlap values of the lidar systems, which is the layer detected by the algorithm during stable situations?

Considering the edge detection, how the specific setup (e.g. energy of the laser beam) of the lidar system can affect the results?

Line 398 - I recommend to add the information about the overlap close to the system description.

Line 406 - I recommend to add the information about the overlap close to the system description.

It would be interesting to present a case with the presence of clouds close to ABLH.

Technical Questions:

I recommend using the same pattern of font style and hour format in the figures.

Fig.1 – Time UTC Fig.6 – Time UTC Fig.11 – Time UTC

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-857, 2020.