

Atmos. Chem. Phys. Discuss., referee comment RC2  
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## **Comment on acp-2021-558**

Anonymous Referee #2

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Referee comment on "The vertical aerosol type distribution above Israel – 2 years of lidar observations at the coastal city of Haifa" by Birgit Heese et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-558-RC2>, 2021

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Review of the manuscript 'The vertical aerosol type distribution above Israel - 2 years of lidar observations at the coastal city of Haifa' by Heese et al.

The manuscript presents an analysis of the vertical distribution of aerosols in Haifa obtained from a two-year period of lidar measurements in Haifa.

Characterization of the vertical distribution of aerosols in the Eastern Mediterranean is reported by few studies. By this reason, the study of these aerosols with lidar will improve the aerosols knowledge in the region. The author uses the PollyXT lidar to obtain the optical properties in order to characterize the aerosol distribution and its typing. The methods used in this paper are well described.

The authors provide results and arrive at scientific conclusions to better understand the general situation of aerosols and their variability in the Eastern Mediterranean. This is a valuable information to the international scientific community.

This paper is suitable for publication in the journal. However, I have a few remarks or suggestions that should be reviewed before publication.

General Comment:

Some parts of the papers should be moved to another parts, in order to give a

description of the all methods used in this study (I suggest to move to one section the explanation of lidar instruments, lidar optical properties profiles, the aerosol typing and discrimination scheme and air masses source methods) and perhaps you could include the case study as a subsection showing the application of this methods. And you should group the results in a section of results and discussion to give a clear presentation of the results and the discussion.

#### Specific comments

In the section regarding to the case study, you should discuss the figure 3 and 4 in a more comprehensive analysis. What happen with the PBL layer in the volume depolarization ratio figure?

In the same section, I suggest to number the optical properties profiles discussions (3.1.1 Particle BSC, 3.1.2 Particle EXT... etc..).