

The authors provided some updates on the manuscript, providing better figures and more context for them. Moreover, they provided very detailed explanations in the rebuttal letter. However, the changes in the main manuscript are still insufficient, and the paper requires a major revision. In general terms, many of the explanations of the rebuttal letter should be adapted as part of the main-body text. Moreover, several sections still require better contextualization to assure a correct and understandable flow of the text. Finally, the novelty of the work should be further emphasized, discussing its advantages with other methods in the state of the art using **published references**.

Here I provide some comments that could help improve the paper:

Please incorporate some comments **in the paper** regarding Mie-scattering lidar (as you provided in the author's response document) in a short paragraph motivating its use in the paper.

The same for the second comment regarding the discussion of autonomous driving versus alternative platforms. This should be discussed in the **main-body text**.

Table 1. It is not clear the meaning of the new fields: is "vehicle lidar measurement accuracy" the mean distance measurement error? Is the "vehicle lidar distance measurement" the minimum distance that the vehicle lidar can measure, or is it its resolution?

Please include **in the text** a brief summary of the lidar model characteristics or cite the corresponding reference when the lidar model is discussed.

Please include in the text the models of the main parts of the hardware. All are not necessary, but at least the Lidar, the computing platform, the vehicle lidar, etc.

Regarding the editing of Sect. 2.4. in the previous review: "Unmanned Mobile Detection Path Planning Algorithm requires extensive editing. [...] In its current form, it feels disconnected from the rest of the manuscript. Many readers of this journal may not have a strong background in control theory; therefore, additional plain-language explanations are needed to bridge the mathematical formulation and its application to your path-planning problem.", the authors provided a detailed description of the control theory and background, but this is not reflected in sufficient changes of the manuscript. Please, either create an appendix with all detailed equations and explanations, or restructure Sect. 2.4. to be self-contained and understandable by non-experts in control theory.

In section 3.1., the discussion regarding MERRA-2 is insufficient. Moreover, according to the data shown in Fig. 5 c), it seems that the high pollution episode is finished the 24/02/2025. You could provide the hourly evolution of MERRA-2 AOD for the 24/02/2025 and compare it against lidar RCS and PM10, PM2.5 measurements.

Lines 213-215: These analysis lines are difficult to understand. Please check the grammar and meaning and rephrase.

In section 3.2. please indicate the exact times "HH:MM UTC" of the cone measurements. Why use 1 h? The measurement time is kind of long, and aerosol/cloud conditions can change extensively during a period of 1 hour (look at Fig.4 for example).

Section 3.2. is uncontextualized with the rest of the manuscript. Please motivate within Section 3.2. what is its purpose. For instance, would the system be used for unmanned conical

scanning? What are its applications? Is there any reference that can be added to support this? Please add the changes in the main body text.

Extensive revision of the document English is required. There are some paragraphs which are difficult to understand by an external reader. I suggest using a grammar revision software or contact an English native editor.

I appreciate the addition of Sect. 4 discussion. However, some improvements are still needed. Apart from the limitations, consider adding the advantages of it: how it is able to measure the aerosol conditions in a controlled environment (your testing site), etc. A more profound explanation of the method limitations is required. For example (don't limit it to this) elaborate a bit more on harsh weather conditions such as rain or snow.