

The following provides a point-by-point list of all modifications made in the manuscript. In the attached version, all changes are highlighted in blue. In addition, all grammatical corrections suggested by the reviewers have been implemented.

1. We removed the second given name of Jorge and the first given name of María Soledad.
2. We have removed the acronym MULHACEN (lines 4, 20, 23, 93, 96, 114, 115, 214, 321, 379, 394, 435, 476, 477, 493, 535, 537, 557, 565, 624, 647, 660 of the previous manuscript). The parts where MULHACEN appeared are highlighted in blue in the revised version of the manuscript.
3. We replaced Ortiz-Amezcuca et al. (2019) (line 129 in the previous version) with Ortiz-Amezcuca et al. (2020) (line 130 in the reviewed manuscript).
4. We introduced the following sentence: “*A technical description of the main instrumental features is detailed in Table 1*” at line 116 (reviewed manuscript), as well as a table containing the technical details of the main optical elements of the Raman lidar system operated at the University of Granada in Section 2.2 (after line 135 in the reviewed manuscript), as suggested by Reviewer 3.
5. It should be noted that the table numbering has been updated, with all tables now renumbered due to the inclusion of an additional table.
6. We introduced the following paragraph in Section 3.3.3 after line 306 in the previous version (lines 307–316 in the reviewed manuscript), as suggested by Reviewer 2:

Thus, the hybrid calibration method relies on the accurate computation of W from lidar measurements, it is essential that the lidar measurements adequately represent the entire atmospheric profile used for W integration. While clear-sky conditions are preferred mainly to avoid limitations associated with noisy profiles during vertical integration, the methodology can also be applied under partly cloudy conditions, if the cloud base is located above the altitude range used for W integration and if the lidar SNR remains sufficiently high (greater than 0.3). Its applicability in the presence of low clouds depends on the size, frequency, and distribution of cloud-free gaps. Provided these gaps are sufficiently large and frequent, the lidar can acquire measurements with adequate SNR, enabling reliable vertical integration and temporal averaging. It should be noted that the achievable SNR depends strongly on specific system characteristics, such as laser power, optical configuration, and detector performance. Therefore, the hybrid methodology can be applied under partly cloudy conditions but depends explicitly on these system characteristics.

7. The paragraph located between lines 407 and 417 in the previous version was moved before Figure 3. Therefore, in the new version of the manuscript, it is located between lines 416 and 426, and after Figure 3.
8. The paragraph located between lines 437 and 449 (previous version) was moved before Figure 4 and Table 3 (now Table 4). In the new version of the manuscript, it is located between lines 446 and 458. Consequently, Figure 4 and Table 4 appear after this paragraph.

9. The paragraph located between lines 460 and 474 (previous version) was moved before Figure 5; its new position is between lines 469 and 484 (new version). Figure 5 follows this paragraph.
10. The sentence “*which are typically associated with more stable atmospheric conditions*” was added in the reviewed manuscript (lines 486–487).
11. The paragraph located between lines 497 and 504 in the previous version was moved before Figure 6; the new position is between lines 506 and 514. Figure 6 follows this paragraph.
12. The paragraph between lines 505 and 511 (previous version) was moved after Table 4 (now Table 5). Its new position is between lines 514 and 520 in the reviewed manuscript. Table 5 precedes this paragraph.
13. We added the following paragraph in the reviewed manuscript between lines 521 and 527, as suggested by Reviewer 3:

However, it is important to note that W ranged from 0.5 to 25 mm, which corresponds to the typical range of minimum and maximum W registered at the Granada station (Vaquero-Martínez et al., 2023). Meteorological conditions can, however, influence the behaviour of water vapour profiles in the incomplete lidar overlap region and, consequently, in the W computation. Despite this,

14. We also added the following sentence, as suggested by Reviewer 3, between lines 539 and 543 of the reviewed version (It should be noted that the last sentence (lines 529–530 in the previous version) was replaced.):

and across a wide range of meteorological conditions (148 profiles analysed from 2011–2023). These results suggest that the applicability of the hybrid methodology is largely independent of atmospheric conditions, avoiding the need for assumptions in this region (e.g., linear interpolation or the assumption of constant water vapour mixing ratio values).