

Response to the Referee #1 comments for the manuscript “Day- and night-time aerosol optical depth implementation in CÆLIS” By Ramiro González et al. in GID

Reviewer comments are in black font (RC), and author comments (AC) in blue font.

RC: I found this infrastructural contribution very useful for the photometry community, as it is open to CIMEL instruments not fitting all the AERONET requirements, but hopefully also to instrument of different type in the near future. From my point of view, this can be considered a real research tool, besides being also operational. It is very well written and clear.

RC: I have only two small comments:

- at page 4, lines 8-15. Here you talk about ancillary data such as meteo and gas content. But the text seems to explain only about meteorological parameters, having the 3 options. This is confirmed by the fact that the only option for the gases is the climatology (sect. 2.3.3). Maybe you can adjust the paragraph.

AC: The reviewer is right, we have now separated the meteorological data and gas climatology, because they are treated differently. For those (rare) places where we have no available satellite data for one month, we use the seasonal average, and if the seasonal average is not available we use an annual average to process the AOD.

We have added the following sentence in the manuscript:

“For absorbing gaseous species, we use a monthly climatology (see section 2.3.3). In case some station does not have data for a certain month, a seasonal mean (or annual, if necessary) is used instead.”

RC: in Eq 1, the term R_2 , as defined by you, shouldn't be at the denominator? Please comment.

AC: Yes, it was a mistake that we have modified it in the revised version. Same mistake also affected equations 3 and 4.