

## ***Interactive comment on “Assessment of nocturnal Aerosol Optical Depth from lunar photometry at Izaña high mountain Observatory” by África Barreto et al.***

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The authors would like to thank the referee #1 for their constructive and useful suggestions. Please, find below our answers to their comments.

» C1 P9.L17-18. What did you mean with “more important ones”? I think it refers to the increased deviation of the 1020nm channel compared to other channels in Fig.5. It looks like you can split the data of the 1020nm channel in Fig.5 to three, or maybe four, different cases with different slopes. Could this be related to temperature differences, as it is stated in the same sentence?

C1

With “the more important ones” we are referring to the highest  $\Delta AOD_{fit}$  values. We agree these different slopes should be clarified. Even though it is well known and documented the temperature dependence of 1020nm measurements performed with the common silicon detectors, we have to admit that the three branches observed in Fig. 5 are not caused by this effect, but by the strong asymmetry with phase angle found in the empirical model parameterized as  $\delta_{g,\theta}$  for 1020nm and 1640nm spectral bands. So, we have two characteristic branches in these two bands: one above and one below the diagonal line. The points above the diagonal line correspond to overcorrected AOD values. It happens for high positive phase angles. On the contrary, the points below the diagonal represent those conditions poorly corrected, and it happens for high negative phase angles. We consider this is a systematic error in our empirical model which reproduces an amplified phase angle dependence in these spectral bands. Finally, the first and most obvious of branches, with  $\delta_{g,\theta}$  values up to 0.09, is observed in the case of high and positive phase angles in some days in October and November, 2014. We suspect that instrumental problems are behind such overcorrection cases. We will introduce in the text these new clarifications, highlighting that the important phase angle dependence found in 1020nm and 1640nm channels might be an artifact.

» C2 P4.22-23. Another question to concerning the 1020nm channels. There are two channels with a nominal wavelength of 1020nm. Are both combined to one channel, or which channel measurements are used in this manuscript? Also it is stated, that the silicon 1020nm channel is temperature corrected. How could the deviation of the 1020nm channel in Fig.5 be related to the temperature then? (see comment 1).

Yes, the CE318-T has one spectral filter with 1020nm as nominal wavelength, and two silicon and InGaAs detectors can be additionally used to measure in this spectral band. The one used in this paper is the silicon 1020nm channel. See comment 1.

» C3 P8.L29 “the three nights”: Which three nights? Either spare the “the” or give the Dates.

C2

We will add the dates of these three nights (April 6th, October 8th and October 16th).

» C4 P8.L29 “ranging from  $-9^{\circ}$  to  $3^{\circ}$ ” → ranging from  $-9^{\circ}$  to  $-3^{\circ}$

Done.

» C5 Fig4. I think it would be good to provide the dates.

We will provide dates (see comment 3).

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