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## ***Interactive comment on “Aerosol vertical distribution, optical properties and transport over Corsica (western Mediterranean)” by J.-F. Léon et al.***

**J.-F. Léon et al.**

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Please find attached as a supplement a detailed answer to your review.

We have identified that the degradation in the quality of the extinction retrieval comes from the choice of the reference signal in the upper part of the profile. The cloud screening is not involved in this issue. Selecting a constant altitude whatever is the signal-to-noise-ratio (SNR) has introduced artifacts in the retrieval of the extinction profiles, including spikes and remaining relatively high extinction coefficient in the upper range of the profile. We now use the SNR to delimit the useable part of the profile. The

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SNR is estimated for each altitude by computing the mean of standard deviation of the range corrected lidar signal at 3 successive altitudes. A threshold value of SNR=10 is still acceptable for most of the profiles and removes spikes and drift in the mean extinction coefficient. However it removes also most of the profiles for which we have identified high AOD and high altitude transport. So the results presented in the last section are affected by a large uncertainty in the extinction coefficient profiles. We suspect that this problem is caused by the dust deposition on the telescope that reduces emission and reception. The case study on the dust event in June-July 2012 is not affected by this problem because during this period an operator was on site. Further investigation on the noise reduction is required to provide accurate estimate of the extinction profiles at high altitude for those cases.

Although we have solved the issue regarding most of the data presented in this paper, the discussion can't be based on analysis of high AOD events since those cases remains problematic and required further analysis. Such analysis is not possible within the limited time frame requested for revision. As a consequence, we believe it is not worth submitting the present revised version of the manuscript. However, we have followed your recommendations regarding the structure of the paper and we expect to have an improved version for a further submission.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/15/C4289/2015/acpd-15-C4289-2015-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., 15, 9507, 2015.

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