

***Interactive comment on* “Long range transport and mixing of aerosol sources during the 2013 North American biomass burning episode: analysis of multiple lidar observations in the Western Mediterranean basin” by G. Ancellet et al.**

Anonymous Referee #2

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In the presented work gives an extensive examination of the aerosol situation in summer 2013 in the Western Mediterranean area. The paper is well written and interesting to read, and I have only minor comments which should be considered before publication in ACP.

Introduction: You define BER as extinction to backscatter ratio. In Section 3.1 you define the lidar ratio (LR) as $BER-1$. To my knowledge the general definition of the LR is extinction-to-backscatter ratio.

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Section 2.1: Please give references for this information.

Section 3.1: Can you give a reference for the forward Klett inversion? Please give more information on the exponent k (order, differences depending on aerosol type).

Section 3.3: What do you mean by ‘Atlantic dust sources’?

Figure 1: Please give the time of the CALIOP tracks and the FALCON 20 flight in the figure caption.

Figure 2: Panels are not top and bottom. Would it be possible to use the same scale for both panels?

Figure 3: How do you explain the very inhomogeneous structure in Depol and CR (especially on 21 June) which seems not really to correspond with the layering shown in R532-plot? Also on 22 June the intensive optical properties seem to be very variable within the aerosol plume. I would not expect such large differences.

Figure 8: Please indicate the source of these plots (FLEXPART?) in the figure caption.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 32323, 2015.

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