

Interactive comment on “Injection of mineral dust into the free troposphere during fire events observed with polarization lidar at Limassol, Cyprus” by A. Nisantzi et al.

Anonymous Referee #1

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This is an excellent work showing a first evidence of soil dust emission enhancement from biomass burning in arid regions. I would suggest the publication of this paper in ACP, after the authors address the following points:

1. MODIS hot spots are provided with a metric of confidence on their detection. A high value on this parameter (e.g. >80%) would enhance the confidence and facilitate the interpretation of the lidar measurements reported by the authors.
2. The trajectories in Figures 3 and 5: In Figure 3, the vertical pathway is plotted only for 2 height levels over Limassol, while in the 2D map, more trajectories are shown. While

C5262

this is considered as a smoke-free case, the trajectories indicate a possible advection from the Northern Black Sea region which may be observed in Limassol. I would suggest that the authors should provide the complete information for the trajectories as well as the confidence level of the fire detection by MODIS in order to strengthen the characterization of each case. This should be done also for the second case (please revise also the trajectory Figure 5, there are 2 green lines that cannot be distinguished).

3. Regarding the scatter in Figure 9: Winter/Summer cases may justify some outliers (winter cases are reported as shown in Figure 7). Soil dust is less likely to contribute to the measurements during winter due to most probably large values of soil moisture which decreases the dust emission.

4. Do the authors have an estimation of the depolarization uncertainty impact on their conclusions?

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C5263