

Review of

Extreme dust storm over the eastern Mediterranean in September 2015: Satellite, lidar, and surface observations in the Cyprus region by Mamouri et al. [revised version]

The paper describes an exceptional dust storm over Cyprus. Using lidar data, visibility studies, satellite data, ground based PM₁₀ measurements and several assumptions it is tried to characterize the event. This should help to improve numerical transport models which failed to predict this dust outbreak.

The authors completely re-wrote the first version of the manuscript taking into account the comments of the review(s), in particular they spent some efforts in minimizing the 'speculative part' as far as possible. This is very much appreciated especially as this is in principle not a simple task because of the large uncertainties of the involved parameters/quantities/measurements. So there is an inherent difficulty to detect any inconsistency. I don't think that further improvements can be achieved in view of the available (and missing) data sets. The results are useful and necessary to support the second paper that is under preparation according to the authors. It will be interesting to see to what extent the disagreement of the lidar derived and the modelled profiles (Figure 4) can be reduced.

Minor comments and notes

- 3/29: 'The uncertainties in all the optical properties...': Here, one of the papers by Gasteiger and colleagues should be cited who performed a lot of quite detailed investigations on this topic (desert dust, volcanic ash).
- 4/12: '± 50': Unit is missing.
- 5/11: Fig. 1: Please mark Limassol in at least one of the panels
- 5/29: Why are the lidar measurements restricted to day-time measurements: lack of personnel? I assume the system does not run unattended?
- 6/8: 'and 600 $\mu\text{g}/\text{m}^3$...'. When averaging over 3 hours this is certainly a lower limit. From Fig. 3a it can be seen that during the first hour the concentration was significantly larger. So it was indeed a strong event!
- 7/17: 'Therefore the area mean values...' What does this mean? Is it – due to the fact that the maximum retrievable values might be exceeded – sort of an estimate of the lower limit?
- 8/16: Paragraph starting with 'To check...': I doubt that it is possible to determine a relationship between PM₁₀ and TSP taking into account the uncertainties of the contributing variables/measurements (during this episode), and I don't understand the message of the related discussion. The authors found an 'excellent agreement' with Kandler's values. On the other hand they present arguments against the assumed values (stating that either $c_{v,d}$ or r_{vis} is wrong). If however r_{vis} is wrong this would feedback to the estimated extinction coefficient and the mass concentration. Some additional explanations would be helpful to avoid possible confusion.
- 10/7: 'termine': typo.