

Interactive comment on “Case study of a multi-layer aerosol structure in the eastern Mediterranean observed with the airborne polarized lidar ALEX during a STAAARTE campaign (7 June 1997)” by F. Dulac and P. Chazette

Anonymous Referee #1

Received and published: 23 June 2003

The paper presents a case study of Saharan dust transport in the free troposphere over the Eastern Mediterranean Sea observed by an airborne polarized lidar system on July 7, 1997.

General comments:

There are improvements compared to the initially submitted version. Some parts of the paper are confusing and are not update. Some other parts are partly wrong and need

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re-phrasing. Some statements presented in the paper and most of the conclusions have been presented previously in the literature. I think that the authors present an interesting case of dust transport. However, they could extract much more information and more interesting results from the data they have. These results could then be reported in the Abstract and the Conclusions part. Therefore, the paper needs further improvement before final acceptance for publication.

Specific comments:

Abstract

The abstract contains information which has been previously published (eg. Saharan dust layers between 2-4 km, mixing of Saharan dust with clouds, Meteosat optical depth values: 0.15-0.30, etc.). If one has a look on the recent literature on the Saharan dust transport over the Mediterranean Sea, several papers have also presented lidar measurements on Saharan dust particles with similar results (eg. Moulin et al., 1998; Hamonou et al., 1999; J.F. Leon et al., Applied Optics, vol. 38, 6918-6926, 1999; Barnaba and Gobbi, JGR, vol. 106, 3005-3018, 2001; De Tomasi et al., Applied Optics, vol. 42, 1699-1709, 2003). Therefore, the abstract should be completely revised.

1. Introduction

The Introduction is too short and does not reference relevant important recent papers (Barnaba and Gobbi, JGR, vol. 106, 3005-3018, 2001; Gobbi et al., Atmospheric Research, vol. 61, 1-14, 2002; De Tomasi et al., Applied Optics, vol. 42, 1699-1709, 2003).

The statement: 'Unfortunately, the ground-based lidars do not allow the observations of the lowermost troposphere ...', should be revised, since a new approach (Wandinger and Ansmann, Applied Optics, vol. 41, 511-514, 2002) permits the aerosol extinction derivation down near the surface. Therefore, the introduction should be completely revised and updated.

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2. Observations

Line 23. No errors in the aerosol extinction and backscattering coefficients is given. The error derivation should be analytically discussed.

2.3 Other data

This section is again too short. The authors should analytically discuss the accuracy of the TM2-Z model and the CIMEL data used.

3.4 Aerosol extinction profiles

The paragraph 'Regarding the lowermost troposphere ... in the column', does not take into account recent literature (eg. Marengo et al., Applied Optics, vol. 36, 6875-6886, 1997; Barnaba and Gobbi, JGR, vol. 106, 3005-3018, 2001; Gobbi et al., Atmospheric Research, vol. 61, 1-14, 2002; De Tomasi et al., Applied Optics, vol. 42, 1699-1709, 2003). This part should be revised and updated.

Technical corrections:

2.1 Airborne measurements

Line 3. Replace the web site address with a relevant paper or publication.

2.2 Meteosat data

Line 22: Provide relevant literature, if available.

3.1 Meteorological situation

Line 1: replace 'low pressure' by 'low-pressure'.

3.4 Aerosol extinction profiles

Line 41: replace 'provide' by 'provides'

4 Conclusions

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Acknowledgements

Last line: Give the correct number of 'No. XXX'.

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