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Patterns of North African dust transport over the Atlantic: winter vs. summer, based on CALIPSO first year data

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Abstract. One of the most important factors that determine the transported dust effect on the atmosphere is its vertical distribution. In this study the vertical structure of North African dust and stratiform low clouds is analyzed over the Atlantic Ocean for the 2006–2007 boreal winter (December–February) and boreal summer of 2006 (June–August). By using the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) backscatter measurements over the dust routes, we describe the differences in dust transport between the seasons. We show a bi-modal distribution of the average dust plumes height in both seasons (it is less clear in the winter). The higher plume top height is 5.1 ± 0.4 km, near the African coast line in the summer and 3.7 ± 0.4 km in the winter. The lower plume merges with the marine boundary layer, in both seasons. Our study suggests that a significant part of the dust is transported near and within the marine boundary layer and interacts with low stratiform clouds.

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