



Transport of mineral dust derived from airborne wind lidar measurements during SALTRACE

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During the SALTRACE field experiment conducted between the 10 of June and the 15 of July 2013, the transport and properties of Saharan dust were characterized by a $2\text{-}\mu\text{m}$ Doppler wind lidar (DWL) deployed on the DLR Falcon 20 research aircraft. Unlike aerosol lidars, the DWL is able to simultaneously measure wind fields and -by means of an adequate calibration- aerosol optical properties, which is more adequate for aerosol transport studies. The retrieved horizontal and vertical wind speed provide a direct observation of dust long range transport mechanisms across the Atlantic (e.g. by the African easterly jet) from Western Africa to the Caribbean. Vertical wind observations revealed the structure of island induced lee waves in the Cape Verde and Barbados regions.

A novel method for the calibration of DWLs based on simultaneous measurements with a ground-based aerosol lidar and sun photometer was developed. After being calibrated, the system is able to retrieve quantitative aerosol backscatter and extinction coefficients, which is usually not obtained from coherent lidars. Results from the validation with a ground-based aerosol lidar in Barbados and the CALIPSO satellite instrument will be discussed.