

Evaluation of the Transport of Atmospheric Sahara Dust on Natal-RN through the LIDAR Technique of Depolarization

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The objective of this work is describe some results of the Natal LIDAR system (DUSTER), an integrating station of The Latin America Lidar Network (LALINET), aimed to detect and evaluate the transcontinental transport of Sahara dust (SD) to the Brazilian territory during the aerosol MOnitoring campaign Long-range Transportation Over Natal I (MOLOTOV I) which occurred from December 2016 to February 2017. The city of Natal is located in northeastern Brazil and is one of the continental points closest to the African continent, a important fact to observe the entry of SD in the South American continent. The DUSTER system allows the detection of signals at wavelengths of 355 nm, 532 nm (parallel), 532 nm (perpendicular) and 1064 nm. To detect and characterize SD aerosols and other particles in the atmosphere, DUSTER uses the ability of suspended aerosol particles to change the polarization state of light. The data retrieved by DUSTER allow calculate fundamental parameters in the characterization of atmospheric aerosols such as linear volume depolarization ratio (δ^v) and particle linear depolarization ratio (δ^p). Campaign data showed that on a few days the value of δ^p varied between 0.09 and 0.33 at a transport altitude within the range of 1-3.3 km above sea level indicating in some cases probably a mixture of SD with other types of aerosols such as marine particles, anthropogenic pollution or biomass burning smoke. The data obtained with DUSTER have allowed verify the seasonality of this transport, the altitudes of detected particles and study its optical properties.

Keywords: Sahara Dust, LIDAR, Depolarization, LALINET, Transcontinental Transport

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