Aerosol Optical Properties In The Atmosphere Of Natal/Brazil Measured A Sun Photometer Of The Aeronet

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The study of atmospheric aerosols contributes to the understanding of radiative forcing and global warming. In addition, aerosols may influence visibility, acid rain, human health and precipitation. Since 2016, Natal, capital of Rio Grande do Norte, Brazil, has a solar photometer (CIMEL) of the RIMA-AERONET network that can identify the presence of biomass burning aerosols and desert dust from Africa. For this identification, it is aimed to characterize the optical properties of these aerosols present in the atmosphere of Natal (RN). The data available by AERONET, at level 1.5, Version 3, provide information on some microphysical characteristics such as Optical Aerosol Depth (AOD), Ångström coefficient (α), Single Scattering Albedo (SSA), Asymmetry Factor (g), Complex Refractive Index (N), Volume Size Distribution (VSD) and Precipitable Water. The data collection period was from August 2017 to August 2018. Aerosols were classified based on global climatologies and their optical properties were described. Observations were compared with daily measurements from satellites and the local LIDAR over the course of a day for a case study. In addition, backward trajectories were modeled with the HYSPLIT model to verify the predominant origin of the air masses. Aerosols present in the atmospheric column of Natal showed monthly means of AOD in the range of 0.10 to 0.15 with peak of 40%, monthly means of α between 0.6 and 0.8 with peak above 30%, bimodal DTV with dominant coarse mode, SSA about 0.8, real part around 1.5, imaginary part raging from 0.0125 to 0.0437 and g above 0.74. The Precipitable Water accompanied the increase of the precipitation for the months of December, January, February and March. The classification identified mixed aerosols (60.40%), marine aerosols (30.69%) and mineral dust (8.91%). The backward trajectories showed that in 51% of the cases the continental aerosols origined from the Africa.