



Role of the Atmospheric General Circulation on the Temporal Variability of the Aerosol Distribution over Dakar (Senegal)

Habib Senghor (1), Eric Machu (2), Frederic Hourdin (3), Amadou Thierno Gaye (1), Moussa Gueye (1), and Mamadou Simina Drame (1)

(1) LPAO-SF, Cheikh Anta Diop University, Dakar, Senegal (habib.senghor@ird.fr), (2) LPO, Institut Universitaire Européen de la Mer, Brest, France, (3) LMD, Université Pierre et Marie Curie, Paris, France

The natural or anthropogenic aerosols play an important role on the climate system and the human health through their optical and physical properties. To evaluate the potential impacts of these aerosols, it is necessary to better understand their temporal variability in relation with the atmospheric circulation. Some previous case studies have pointed out the influence of the sea-breeze circulation on the vertical distribution of the aerosols along the Western African coast. In the present work, Lidar (Ceilometer CL31; located at Dakar) data are used for the period 2012-2014 together with Level-3 data from CALIPSO (Cloud–Aerosol Lidar and Infrared Pathfinder Satellite Observations) between 2007 and 2014 for studying the seasonal cycle of the vertical distribution of aerosols over Dakar (17.5°W, 14.74°N). Both instruments show strong seasonal variability with a maximum of aerosol occurrence in May over Dakar. The CL31 shows a crucial impact of sea-breeze circulation on the diurnal cycle of the Mixed Atmospheric Boundary Layer and a strong dust signal in spring in the nocturnal low-level jet (LLJ) located between 500 and 1000 m altitudes over Dakar.