



Transport and Vertical Distribution of Urban Pollutants over the Guinean Gulf

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In the countries of the Guinean Gulf, the population has been growing rapidly during the last decades. The sustained economic growth is associated with increased emissions from traffic, industries, and households, and with high pollution levels. Particulate matter (PM₁₀) emissions from urbanized areas are analyzed in the Guinean gulf coastal region by both models (WRF and CHIMERE) and observations during the beginning of the monsoon from May to July.

From the Guinean gulf coast to the Sahel, the urban PM₁₀ concentrations are highest in June, and they display frequent northward transport events. These urban pollution transport events occurred over the entire Guinean Gulf coastal region with a zonal gradient of low concentration in Abidjan to high concentration in Lagos. The main drivers are the absence of precipitation and low wind associated with the low boundary layer height. The major part of the urban pollution is transported at night in the surface layer (3 m/s), but a significant part of the pollution is caught by the low level jet and transported rapidly (15 m/s). All these results highlight specific atmospheric conditions leading to high urban pollution events along the coast and to pollution transport reaching the Sahel, which may severely impact human health.