



## **Handheld sun photometer measurements in Southwestern Africa: results from Benin and Ivory Coast.**

Jean-François Leon (1), Aristide Akpo (2), Mohamadou Bedou (3), Marleine Bodjrenou (2), Julien Djossou (2), Ismael Konaté (4), Véronique Yoboué (3), and Cathy Liousse (1)

(1) Laboratoire d'Aérodologie, Université Paul Sabatier, CNRS, Toulouse, France, (2) Laboratoire de Physique du Rayonnement, Université d'Abomey Calavi, BP 526, Cotonou, Bénin, (3) Laboratoire de Physique de l'atmosphère, Université de Cocody, Abidjan, Côte d'Ivoire, (4) Station géophysique de Lamto, N'Douci, Côte d'Ivoire

The atmosphere of the Gulf of Guinea and adjacent countries is influenced by a large amount of aerosol particles advected from the African continent. This place is one of the hot-spot of aerosol optical depth (AOD) in the world. However AOD in situ observations remains scarce in this area. We present in this paper new measurements of the AOD at 4 sites in southwestern Africa: Cotonou (6.37°N, 2.43°W) and Savè (8.1°N, 2.4°E) cities in Benin, and Abidjan (5.34°N, 3.99°W) city and Lamto (6.22°N, 5.03°W) observatory in Côte d'Ivoire. We use a lightweight handheld sun photometer measuring the solar irradiance at 465, 540 and 619 nm operated manually once per day. Measurements are performed without cloud cover in the field of view. Possible remaining cloud contamination is removed by checking the AOD variability during the measurement sequence. A total of 708 daily observations have been acquired in 2015. The AOD time series in Benin and Ivory Coast highlight a seasonal cycle with a maximum during the dry season (December-Mars) and a minimum during the wet season (May-September). The Angström exponent derived from the spectral AOD measurements enables to attribute the maximum AOD to the presence of large desert dust particles advected by the Harmattan wind during the dry season. We have found an excellent agreement (overall correlation coefficient  $R=0.85$ ) between our data set and the MODIS (Moderate Imaging Spectroradiometer) aerosol products.