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Impact of vegetation fires on tropospheric chemical composition in the Guinean Gulf and on megacities air quality.

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In the framework of the preparation of the "Dynamics-Aerosol-Chemistry-Cloud Interactions in West Africa" (DACCIWA) project, the tropospheric chemical composition in the megacities along the Guinean Gulf is studied using the WRF and CHIMERE regional models. Two simulations are performed for the May-July 2014 period, without and with biomass burning emissions. The impact of biomass burning from Central Africa is quantified for aerosol optical depth, gaseous species (ozone and carbon monoxide) and particulate matter with a mean mass median of diameter less than 10 μm (PM_{10}, both concentrations and chemical composition). We show that vegetation fires in Central Africa represent an important contribution to air pollution in urbanized areas located in the Guinean Gulf. On average in July 2014, CO and O_3 concentrations are increased in Abidjan (Ivory Coast) by 38.5% and 15.4% respectively. In Abidjan and Lagos (Nigeria), two of the biggest megacities in southern West Africa, a net increase of PM_{10} by 36.5% and 53.5% is quantified. The analysis of the chemical composition of PM_{10} shows that this increase is mainly related to an increase of Particulate Primary Matter and Particulate Organic Matter in the fine mode of the aerosol size distribution.