



The impact of the mesoscale convective systems (MCS) on aerosol physical and chemical properties, focusing on hygroscopicity, during the AMMA campaign

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During the AMMA field campaign, the French ATR-42 aircraft flew with aerosol instrumental settings. Measurements taken on-board enabled us to observe and study, first, the size and concentration characteristics and, further, the chemical properties. In addition, one cloud condensation nuclei (CCN) counter was installed aboard the ATR-42. These measurements were carried out to improve the knowledge of the hygroscopic properties of aerosols in the West African region. In this study we will focus on the impact of the mesoscale convective systems (MCS) on aerosols.

The study of the MCS is based on two flights, one before and another one after the passage of a convective system. As the flight plans being similar, the differences observed on aerosol properties can be allotted to the MCS. The study case, presented here, is on July 1st and 2nd, 2006, before the monsoon onset. In comparing the CCN/CN ratio before and after the MCS, we can observe an increase of the hygroscopic characteristics of the Saharan Aerosol Layer (SAL). This decreasing is correlated with the apparition of a nitrate coating on particles of the coarser mode. The nitrate is highly soluble element, so this coating involves an increasing of the hygroscopic capacities.

In order to better explain the process that changes the aerosol surface properties, we will use the French 3D mesoscale model MesoNH. This model will allow us to better understand the internal circulation of the MCS and its impact on the aerosol properties.