A pre-operational assimilation system of aerosols at Météo-France : Volcanic ash and air quality applications

Laaziz El Amraoui, Matthieu Plu, and Bojan Sic

CNRM, Météo-France & CNRS, UMR 3589, Toulouse, France (laaziz.elamraoui@meteo.fr)

Extreme events such as desert dust outbreaks or volcanic eruptions are an important sources of aerosols in the troposphere and have a direct involvement in the tropospheric composition: Desert aerosols directly influence air quality while volcanic aerosols has a great impact on civil aviation. It is therefore important to better understand the evolution and long-range transport of these types of aerosols in order to assess their impact in the atmospheric system as well as in aviation safety.

In order to evaluate routinely the impact of these extreme events on our atmospheric system, we have developed a pre-operational assimilation system of aerosols in order to produce daily analyses of different types of aerosols that may be useful for airborne navigation as well as for air quality standards. The assimilation system is based on the chemistry-transport model MOCAGE and its assimilation system DAIMON.

In this contribution we will present this tool and we will assess the capacity of assimilation of different aerosol products in terms of AOD or lidar profiles to improve the daily three-dimensional concentration of aerosols during extreme events (desert aerosol transport or volcanic eruption). We will also evaluate the added value of the aerosol analyses in terms of different observation systems for better characterizing the plumes of ash or of other pollutants.