Coupled assimilation of satellite and ground based ozone data in order to improve modeling of Air Quality over Europe (POGEQA)

R. Dupont (1), J.L. Attié (1), L. El Amraoui (1), B. Josse (1), M. Joly (1), and E. Jaumoillé (2)

(1) CNRM-GAME / Météo-France and CNRS, URA 1357, Toulouse, France, (2) CERFACS / Météo-France, Toulouse, France

The POGEQA (Observation of Air Quality from a Geostationary Platform) project aims at defining optimal characteristics for a future instrument in geostationary orbit complementing current observations for Air Quality monitoring and forecasting. In this context, we perform simulations of key pollutants (e.g. ozone and carbon monoxide) in the lowermost troposphere at relevant spatial (less than 20 km) and temporal (one hour) scales using a sophisticated chemical data assimilation system used at Météo-France, MOCAGE-PALM. This study investigates the interest of coupled satellite (IASI) and ground-based (AIRBASE) data assimilation in monitoring air quality, with focus on lower troposphere measurements of ozone. We compare the performance of MOCAGE-PALM in four configurations: Free Run (no assimilation), Ground-Based assimilation Run, Satellite assimilation Run and coupled Ground-Based and Satellite assimilation Run. We discuss each configuration and compare lower troposphere simulation of ozone with in situ data . Finally, in the context of assessing the added value of the proposed geostationary satellite platform MAGEAQ (Monitoring the Atmosphere from Geostationary orbit for European Air Quality), we identify needs for each observing platforms in order to better estimate lower troposphere ozone concentrations and monitor Air Quality.