



Satellite determination of regional aerosol properties over Paris and the surrounding area

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One of the main objectives of the MEGAPOLI project is to assess impacts of megacities and large air-pollution hot-spots on local, regional and global air quality. Megacities are considered as more than ten million inhabitants or more than 2000 inhabitants /km². Paris and London are the only cities in Europe that fit the definition of a megacity. As part of the activities at the MEGAPOLI project in summer 2009 a field campaign was performed in Paris and its surroundings. Paris was chosen for various scientific and logistical reasons, but mainly because it is a very concentrated European urban pollution hot spot surrounded by rural areas. The effects of air pollution in Palaiseau and Creteil generated from Paris have been analyzed. Palaiseau and Cretil are located 30 km southwest and 10 km southeast of Paris respectively.

The instrumentation used for this study was: the Advanced Along Track Scanning Radiometer (AATSR), flying on ENVISAT; and MODIS-Terra; sun photometer measurements obtained from the AERONET sun photometer network in Palaiseau and Creteil. AATSR and MODIS provide information on the regional distribution of aerosol properties; AERONET provides information on local aerosol properties which is used to validate the satellite data but also to study gradients in along-wind situations. The wind speed and direction, jointly with the back trajectories for the polluted day event specifically were used to determine gradients.

To calculate the Aerosol Optical Depth (AOD) and the Ångström Exponent (AE), with the AATSR data, we use a combination of coarse and fine mode aerosol models. AOD values at 550 nm were around 0.2 and AE (870-440) was higher than 1.2 for most of the days.