Geophysical Research Abstracts
Vol. 15, EGU2013-7164, 2013
EGU General Assembly 2013

Aerosol variability over the Mediterranean basin from 2005-2012 POLDER-3/PARASOL and AERONET/PHOTONS measurements

Isabelle Chiapello (1), Fabrice Ducos (1), François Dulac (2), Jean-François Léon (3), Marc Mallet (3), Didier Tanré (1), and Philippe Goloub (1)

(1) LOA, CNRS/University of Lille, Villeneuve d'Ascq, France (isabelle.chiapello@univ-lille1.fr), (2) LSCE CEA/CNRS/UVSQ, Gif-sur-Yvette, France, (3) LA CNRS/UPS, Toulouse, France

POLDER-3 (Polarization and Directionnality of the Earth's Reflectances) has been launched on board the PARASOL microsatellite in December 2004. Although the PARASOL orbit has been lowered twice (in September 2009 and in November 2011) compared to the other platforms of the A-Train constellation, POLDER observations continue, providing now more than seven years of innovative retrievals of aerosol properties from space.
In this study we focus on analyzing POLDER-3 capabilities to derive both aerosol loads (Total Aerosol Optical Thickness) and size properties (fine and coarse spherical/non-spherical Aerosol Optical Thickness, Angström coefficients) over oceanic surfaces.
This analysis, as part of the ChArMEx (the Chemistry-Aerosol Mediterranean Experiment) program, focus on the Mediterranean basin, a region under the influence of a complex mixture of aerosols from different sources. Especially we aim to investigate the respective contributions of (i) pollution aerosols (emitted by industry and urban environments of some European regions or megacities surrounding the basin), (ii) carbonaceous particles (from biomass burning events), (iii) mineral dust exported from arid and semi-arid regions of North Africa.

In a first step, our study consists in an analysis of aerosol variability retrieved from AERONET/PHOTONS photometer records from selected sites located in Western part of the Mediterranean basin (i.e. Soust-East of France, Spain, Corsica/Sardinia), as well as central part (i.e. Italia and Lampedusa), and Eastern part (i.e. Greece and Turkey). These measurements provide a unique characterization of both aerosol load (aerosol optical depth) and properties (size distribution and absorption though single scattering albedo) and their temporal variability over each part of the Mediterranean basin. The second step focus on a regional validation of the PARASOL monthly aerosol products by comparison with these equivalent and selected ground-based AERONET/PHOTONS photometer measurements.

Overall such a regional analysis is expected to provide an improved view of aerosol spatial and temporal variability over the Mediterranean basin, by combining the longest time-series of ground-based photometer aerosol measurements with the pluri-annual PARASOL observations. Special interest will be given to (i) assessment of reliability and quality of the more than seven years of POLDER-3 aerosol retrievals (ii) better understanding of the influence of the various natural and anthropogenic sources of aerosols in the different parts of Mediterranean basin.