



Evaluation of a mesoscale aerosol model over Europe and Greater Paris with chemical and optical data from AERONET and LISAIR campaign

M. Tombette (1), P. Chazette (2), B. Sportisse (1), K. Sartelet (1) and E. Debry (1)

(1) CEREAs, École Nationale des Ponts et Chaussées/EDF R&D, Champs sur Marne, France,

(2) CEA, Laboratoire des Sciences du Climat et de l'Environnement, Gif-sur-Yvette, France.

(marilyne.tombette@cerea.enpc.fr / Phone: 33 1 64 15 21 43)

The understanding of aerosol physics and processes is a challenging issue. Aerosol models evolve in the light of new parameterizations often deduced from experimental results, and may thereafter be compared to data to assess the importance of parameterizations and associated processes. For such assessment, the aerosol model SIREAM, embedded in the Polyphemus platform (<http://www.enpc.fr/cerea/polyphemus>), may be used with the mesoscale chemistry-transport model Polair3D. It has been compared by the past over Europe, Asia and Greater Paris to station data (PM, ozone, NO_x, nitrate, sulphate, ammonium, chlorure and sodium concentrations). Polyphemus now accounts for the computation of aerosol optical parameters (refraction index, optical thickness AOT, single-scattering albedo SSA, etc.). This contribution aims at presenting new developments in the model, like optical computations and new parameterizations (organics, heterogeneous formation of nitrate). The improvements are evaluated by comparing the results to data over Europe and over Greater Paris. In the first study, the simulated AOT and SSA are compared over Europe with data from the AERONET network at 550 nm. The model shows a relatively good agreement. As the instrumental error is known, it is compared to the model error. The instrumental error is large for low AOT values, whereas the model error is larger than the instrumental error for large AOT values. In a second part, the model results over Greater Paris are compared to lidar data from the LISAIR (Lidar pour la Surveillance de l'AIR) campaign. This campaign also provides chemical and granulometric data, that allows us to evaluate in

details the improvements due to the recent developments.