

Dr. Matthias Beekmann

LISA ([Laboratoire Interuniversitaire des Systèmes Atmosphériques](#)),
UMR CNRS 7583, Universités Paris-Est Créteil , Université Paris Diderot
Université Paris Est Créteil, CMC
61, avenue du Général de Gaulle
94010 Créteil France

Email : matthias.beekmann@lisa.u-pec.fr

Tel : +33 (1) 82392096



Matthias Beekmann is senior researcher at Centre National de Recherche Scientifique. He codeveloped the CHIMERE chemistry-transport model which today is in widespread use for operational air quality forecast and simulation. He initiated an intensive measurement campaign in the Paris agglomeration in order to better constrain fine particulate matter sources in a European megacity. He is also interested in using satellite measurements for data assimilation or inverse modelling. Matthias Beekmann was president of the French scientific program committee LEFE/CHAT (CHemistry of the Atmosphere). He is president of the Conseil Académique of University Paris-East. He is director of the Observatoire des Sciences de l'Univers EFLUVE (Enveloppes FLUides de la Ville à l'Exobiologie).

Air pollution from urban to continental scales: common problems in different continents

Matthias Beekmann (1), A. Cheiney-Fortems (1), A. Cholakian (1,2), G. Ciarelli (1,2), A. Colette (2), I. Coll (1), G. Dufour (1), G. Foret (1), I. Konovalov (3), M. Lachatre (1), Q.J. Zhang (1,4).

- (1) Laboratoire Interuniversitaire des Systèmes Atmosphériques (LISA), UMR CNRS 7583, University Paris Est Créteil, University Paris Diderot, France
- (2) Institut National de l'Environnement Industriel et des Risques, Parc Technologique ALATA, Verneuil-en-Halatte, France
- (3) Institute of Applied Physics, Russian Academy of Sciences, Nizhniy Novgorod, Russia
- (4) Nanchang Yiyunran KINTON Technologies Co. Ltd.

Particulate matter pollution is today one of the major issues in atmospheric sciences due to its related health and climate impact. Among its components, organic aerosol is the least well characterized, because composed of thousands of semi and non-volatile molecules. Its modelling in 3D air quality models is based on parametrisations, which need to be carefully evaluated with observations. The first part of the talk will be devoted to the quantification of the formation of

secondary organic aerosol in various environments: urban – the Paris Megacity and its surroundings, remote - the Mediterranean region, and even more remote – Siberia for the case of fire emissions. For this, observations from intensive campaigns and satellite data, will be compared to modelling results. For the example of fire emissions, it is shown that secondary organic aerosol build-up in the plume is as high as primary emissions.

The second part of the talk is devoted to inorganic aerosol build-up. Both for China and Europe, acid precursor emissions (SO_2 and NO_x) have decreased (respectively during last years and last two decades), while ammonia emissions (major base) kept rather constant. This causes important changes in the formation regime of ammonium nitrate and the partition of total nitrate and ammonium between the gas and particulate phase. Model results documenting these changes are presented. For China, a companion paper is submitted on this issue presenting modelling results constrained with surface and satellite measurements.

Last, also future scenarios for Europe are presented, comparing the impact of future changing climate and emissions on the particulate matter, but also ozone load.