

# List of research activities

2017

CEREA



## CEREA - Centre d'Enseignement et de Recherche en Environnement Atmosphérique

Atmospheric Environment Center

École des Ponts ParisTech & EDF R&D

6-8 avenue Blaise Pascal – Cité Descartes  
Champs-sur-Marne  
77455 Marne-la-Vallée cedex 02, France

Tel.: +33 (0) 1 64 15 21 57

<http://cerea.enpc.fr>

Director: Christian Seigneur  
Director: Pietro Bernardara  
Deputy director: Luc Musson-Genon  
Deputy director: Marc Bocquet

Staff: 28 (as of 31 December 2017)

## LABORATORY STAFF

### Permanent research staff and faculty

- **ANGOT Guillaume**, EDF R&D, Research engineer
- **BERNARDARA Pietro**, EDF R&D, Director
- **BOCQUET Marc**, École des Ponts ParisTech, Senior Research scientist (ICPEF) and Professor, HDR
- **CARISSIMO Bertrand**, EDF R&D, Senior Research scientist and Associate professor, HDR
- **DUPONT Éric**, EDF R&D, Research engineer
- **MUSSON-GENON Luc**, EDF R&D, Research engineer (IGPEF)
- **ROUSTAN Yelva**, École des Ponts ParisTech, Research scientist (CR1)
- **SARTELET Karine**, École des Ponts ParisTech, Research scientist (DR2), HDR
- **SEIGNEUR Christian**, École des Ponts ParisTech, Director and Professor, HDR

### External collaborators

- **MALLET Vivien**, INRIA, Research scientist (CR1)

### Visiting Scientist

- **METREF Sammy**, CNRS and University Buenos Aires, Argentina
- **NANA Bernard**, University Ouagadougou, Burkina Faso
- **RAANES Patrick**, Nansen Environmental and Remote Sensing Center, Bergen, Norway
- **ZHANG Yang**, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, USA

### Post-doctoral scientists

- **CHAHINE Ali**, École des Ponts ParisTech
- **MESSINA Palmira**, École des Ponts ParisTech
- **NSIR Rémy**, École des Ponts ParisTech
- **RAFFORT Valentin**, École des Ponts ParisTech

### Ph.D. students

- **BAHLALI Meissam**, EDF R&D, ED SIE
- **CHEN Ruiwei**, École des Ponts ParisTech, ED SIE
- **CHRIT Mounir**, École des Ponts ParisTech, ED SIE
- **DEFFORGE Cécile**, EDF R&D, ED SIE
- **FARCHI Alban**, École des Ponts ParisTech, ED SIE
- **FILLION Anthony**, École des Ponts ParisTech and CERFACS, ED SIE
- **HAUSSAIRE Jean-Matthieu**, École des Ponts ParisTech, ED SIE
- **MAJDI Marwa**, École des Ponts ParisTech, ED SIE
- **MÖLLER Tim**, École des Ponts ParisTech, ED SIE
- **RAFFORT Valentin**, École des Ponts ParisTech, ED SIE
- **THOREY Jean**, Inria & EDF R&D, ED Sciences Mathématiques Paris Centre
- **THOURON Laëtitia**, École des Ponts ParisTech, ED SIE

## Interns

- **DENOUX Matthieu**, École des Ponts ParisTech
- **LU Yao**, École des Ponts ParisTech
- **LUGON Lya**, École des Ponts ParisTech
- **OUARMA Issoufou**, École des Ponts ParisTech

## Engineers, administrative staff, and technicians

### Engineers

- **BRESSON Raphaël**, EDF R&D, Engineer
- **DEMENGEL Dominique**, EDF R&D, Engineer
- **KIM Youngseob**, École des Ponts ParisTech
- **LEFRANC Yannick**, EDF R&D, Engineer
- **LEGORGEU Carole**, École des Ponts ParisTech, Engineer
- **WENDUM Denis**, EDF R&D, Engineer

### Administrative staff

- **DEHLINGER Véronique**, École des Ponts ParisTech

### Technicians

- **FAUCHEUX Aurélien**, École des Ponts ParisTech
- **MOQUILLON Morgane**, EDF R&D
- **ROZBORSKI Sébastien**, EDF R&D

## RESEARCH

### Publications

#### Articles in peer-reviewed international journals

- **Bocquet, M.** and A. Carrassi. *Four-dimensional ensemble variational data assimilation and the unstable subspace*. Tellus A, 69:1304504, 2017, doi:10.1080/16000870.2017.1304504.
- **Bocquet, M.**, K. S. Gurumoorthy, A. Apte, A. Carrassi, C. Grudzien, and C. K. R. T. Jones. *Degenerate Kalman filter error covariances and their convergence onto the unstable subspace*. SIAM/ASA J. Uncertainty Quantification, 5:304-333, 2017, doi:10.1137/16M1068712.
- Carrassi, A., **M. Bocquet**, A. Hannart, and M. Ghil. *Estimating model evidence using data assimilation*. Q. J. R. Meteorol. Soc., 143:866-880, 2017, doi: 10.1002/qj.2972.
- Wang, Y., F. Counillon, I. Bethke, N. Keenlyside, **M. Bocquet**, and M.-L. Shen. *Optimising assimilation of hydrographic profiles into isopycnal ocean models with ensemble data assimilation*. Ocean Modelling, 114:33-44, 2017, doi: 10.1016/j.ocemod.2017.04.007.
- **Liu, Y., J.-M. Haussaire, M. Bocquet, Y. Roustan**, O. Saunier, and A. Mathieu. *Uncertainty quantification of pollutant source retrieval: comparison of Bayesian methods with application to the Chernobyl and Fukushima-Daiichi accidental releases of radionuclides*. Q. J. R. Meteorol. Soc., 143:2886-2901, 2017, doi: 10.1002/qj.3138.
- **Chrit, M., K. Sartelet**, Sciare, J., Pey, J. and Marchand, N. and Couvidat, F. and Sellegri, K. and Beekmann, M. (2017), *Modelling organic aerosol concentrations and properties during ChArMEx summer campaigns of 2012 and 2013 in the western Mediterranean region*. Atmos. Chem. Phys., 17, 12509-12531, doi:10.5194/acp-2017-312.
- Berland, K., Rose, C., Pey, J., Culot, A., Freney, E., Kalivitis, N., Kouvaratis, G., Cerro, J. C., Mallet, M., **Sartelet, K.**, Beckmann, M., Bourriane, T., Roberts, G., Marchand, N., Mihalopoulos, N., and Sellegri, K. (2017), *Spatial Extent of New Particle Events over the Mediterranean basin from multiple ground-based and airborne measurements*. Atmos. Chem. Phys., 17, 9567-9583, doi:10.5194/acp-2016-931.
- Arndt J., Sciare J., Mallet M., Roberts G.C., Marchand N., **Sartelet K.**, Sellegri K., Dulac F., Healy R.M., and Wenger J.C. (2017), *Sources and mixing state of summertime background aerosol in the northwestern Mediterranean basin*. Atmos. Chem. Phys., 17, 6975-7001, doi:10.5194/acp-2016-1044.
- **Thorey, J.**, V. Mallet, and P. Baudin (2017), *Online learning with the continuous ranked probability score for ensemble forecasting*, Q. J. R. Meteorol. Soc. 143, 521-529, doi:10.1002/qj.2940.

- Ars, S., G. Broquet, C. Yver Kwok, **Y. Roustan**, L. Wu, E. Arzoumanian, and P. Bousquet (2017), *Statistical atmospheric inversion of local gas emissions by coupling the tracer release technique and local-scale transport modelling: a test case with controlled methane emissions*, *Atmos. Meas. Tech.* 10, 5017-5037, doi:10.5194/amt-10-5017-2017.
- **Chen, R.**, V. Aguilera, V. Mallet, F. Cohn, D. Poulet, F. Brocheton (2017), *A sensitivity study of road transportation emissions at metropolitan scale*, *J. Earth Sci. Geotech. Eng.* 7, 151-173.
- Commenges, H., L. Tomasoni, **C. Seigneur**, O. Bonin, F. Leurent, C. Bonhomme and J.-F. Deroubaix, *Who is the expert? Integrated urban modeling and the reconfiguration of expertise*, *J. Urban Technol.* 24, 89-108 (2017); reprinted in French, *L'expertise est-elle soluble dans la modélisation intégrée ?*, in *Les instruments de l'action publique et le pilotage des territoires : regards théoriques et empiriques*, J.-C. Némery, F. Thuriot, eds., L'Harmattan, Paris, France (2016), doi:10.1080/10630732.2017.1284990.
- **Thouron L., C. Seigneur, Y. Kim, C. Legorgeu, Y. Roustan** and B. Bruge, *Simulation of trace metals and PAH atmospheric pollution over Greater Paris: Concentrations and deposition on urban surfaces*, *Atmos. Environ.* 167, 360-376 (2017) doi:10.1016/j.atmosenv.2017.08.027.
- Colette, A., C Andersson, A. Manders, K. Mar, M. Mircea, M-T Pay, **V. Raffort**, S. Tsyro, C. Cuvelier, M. Adani, B. Bessagnet, R. Bergström, G. Briganti, T. Butler, A. Cappelletti, F. Couvidat, M. D'Isidoro, T. Doumbia, H. Fagerli, C. Granier, C. Heyes, Z. Klimont, N. Ojha, N. Otero, M. Schaap, K. Sindelarova, A. Stegehuis, **Y. Roustan**, R. Vautard, E. Van Meijgaard, M. Vivanco, and P. Wind, *EURODELTA-Trends, a multi-model experiment of air quality hindcast in Europe over 1990-2010*, *Geosci. Model Dev.* 10, 3255-3276 (2017), doi:10.5194/gmd-10-3255-2017.
- Baklanov, A., D. Brunner, G. Carmichael, J. Flemming, S. Freitas, M. Gauss, Ø. Hov, R. Mathur, K.H. Schlünzen, **C. Seigneur**, and B. Vogel, *Key issues for seamless integrated chemistry-meteorology modeling*, *Bull. Amer. Meteor. Soc.* 98, 2285-2292 (2017), doi:10.1175/BAMS-D-15-00166.1.
- Mazoyer, M., C. Lac, **L. Thouron**, T. Bergot, V. Masson, and **L. Musson-Genon**, *Large eddy simulation of radiation fog: impact of dynamics on the fog life cycle*, *Atmos. Chem. Phys.* 17, 13017-13035 (2017), doi:10.5194/acp-17-13017-2017.

## Articles in other journals or book chapters

## Books

## International conference proceedings

- **Sartelet K., Kim Y., Seigneur C.**, (2017): Emissions from vehicle exhaust of gaseous precursors of atmospheric particles. *International Conference and Exhibition SIA Powertrain*, Versailles, 7-8 June 2017.
- **Bahlali M., Dupont E., Carissimo B.**, (2017): A hybrid CFD RANS/Lagrangian approach to model atmospheric dispersion of pollutants in complex urban geometries. *18th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, 9-12 October 2017, Bologna, Italy.

## National conference proceedings

- 

## International conference oral presentations

- Grudzien, C., A. Carrassi and **M. Bocquet**: Dynamically constrained uncertainty for the Kalman filter covariance in the presence of model error, *European Geosciences Union General Assembly 2017*, April 23-28, 2017, Vienna, Austria.
- **Bocquet, M.**: Tutorial on data assimilation, *Emerging Applications of Data Assimilation in the Geosciences*, Lorentz Center, March 13-17, 2017, Leiden, The Netherlands. [invited]
- **Bocquet, M.**, P. Sakov and **J.-M. Haussaire**: An iterative ensemble Kalman filter in presence of additive model error, *12<sup>th</sup> EnKF Workshop*, June 12-14, 2017, Bergen, Norway.
- **Fillion, A.**, **M. Bocquet** and S. Gratton: Quasi static ensemble variational data assimilation, *12<sup>th</sup> EnKF Workshop*, June 12-14, 2017, Bergen, Norway.
- Metref, S., J. Ruiz, A. Hannart, **M. Bocquet**, A. Carrassi and M. Ghil: Estimating model evidence using ensemble-based data assimilation with localization, *12<sup>th</sup> EnKF Workshop*, June 12-14, 2017, Bergen, Norway.
- Pannekoucke, O., S. Ricci, R. Ménard, **M. Bocquet** and O. Thual: Parametric Kalman filter : toward an alternative to the EnKF, *12<sup>th</sup> EnKF Workshop*, June 12-14, 2017, Bergen, Norway.

- Grudzien, C., A. Carrassi and **M. Bocquet**: Dynamically constrained uncertainty for the Kalman filter covariance in the presence of model error, *12<sup>th</sup> EnKF Workshop*, June 12-14, 2017, Bergen, Norway.
- Carrassi, A. and **M. Bocquet**: Dynamics-based reduction of data assimilation for chaotic models, *AVENUE meeting*, CERFACS, June 20-21, 2017, Toulouse, France. [invited]
- **Bocquet, M.**, A. Carrassi, et al.: On the convergence of (ensemble) Kalman filters and smoothers onto the unstable subspace. *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy. [invited]
- Grudzien, C., A. Carrassi and **M. Bocquet**: A Dynamically Driven Paradigm for Data Assimilation in Geophysical Models, *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, September 11-14, 2017, Erlangen, Germany. [invited]
- **Bocquet, M.**: A. Carrassi and C. Grudzien: Dynamics-based reduction of data assimilation for chaotic models, *Data Science & Environment*, July 3-7, 2017, Brest, France.
- **Bocquet, M.**: On data assimilation in geophysics, journées du réseau Stratège de l'INRA, May 9-10, 2017, AgroParisTech, Paris, France. [invited]
- **Bocquet, M.**: Uncertainty quantification of pollutant source retrieval: comparison of Bayesian methods with application to the Chernobyl and Fukushima Daiichi accidental releases of radionuclides, June 1, 2017, Seminar at the Royal Meteorological Institute of Belgium, Brussels, Belgium. [invited]
- **Defforge, C.**, **M. Bocquet**, R. Bresson, and **B. Carissimo**: Improving local scale atmospheric simulation using data assimilation. *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.
- Grudzien, C., A. Carrassi and **M. Bocquet**: Extending Assimilation in the Unstable Subspace to the presence of additive model error. *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.
- **Farchi, A.** and **M. Bocquet**: Implementing localisation in particle filters. *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.
- Pannekoucke, O., S. Ricci, R. Ménard, **M. Bocquet**, and O. Thual: Parametric Kalman filter: toward an alternative to the EnKF, *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.



- **Defforge, C., M. Bocquet, R. Bresson, P. Armand, and B. Carissimo:** Improving CFD simulations of dispersion around industrial sites and urban neighbourhoods. *18<sup>th</sup> international conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, Bologna, Italy, 9-12 October 2017.
- **Bocquet, M., Y. Liu, J.-M. Haussaire, Y. Roustan, O. Saunier, A. Mathieu:** Uncertainty quantification of pollutant source retrieval: comparison of Bayesian methods with application to the Chernobyl and Fukushima Daiichi accidental releases of radionuclides. IMT-Atlantique/Lab-STICC seminar, 23 November 2017, Brest, France. [invited]
- **Defforge, C., M. Bocquet, R. Bresson, and B. Carissimo:** Improving local scale atmospheric simulation using data assimilation. *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.
- **Defforge, C., M. Bocquet, R. Bresson, P. Armand, and B. Carissimo:** Improving CFD simulations of dispersion around industrial sites and urban neighbourhoods. *18<sup>th</sup> international conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, Bologna, Italy, 9-12 October 2017
- **Bahlali, M., B. Carissimo, E. Dupont:** Adaptation of the Lagrangian module of a CFD code for atmospheric dispersion of pollutants in complex urban geometries and comparison with existing Eulerian results. *18<sup>th</sup> international conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, Bologna, Italy, 9-12 October 2017.
- **Roustan Y.:** Multiscale modeling of air pollution. *5<sup>th</sup> University Global Partnership Network workshop*, 6 June 2017, Guildford, England.
- **Quérel A., D. Quélo, Y. Roustan, A. Mathieu :** Implementation of a new in-cloud wet deposition scheme into the LDX atmospheric transport modelling. *18<sup>th</sup> International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, 9-12 October 2017, Bologna, Italy.
- **Cuvelier K., W. Aas, C. Andersson, B. Bessagnet, G. Briganti, T. Butler, A. Cappelletti, A. Colette, F. Couvidat, M. D'Isidoro, H. Fagerli, A. Manders, K. Mar, M. Mircea, N. Ojha, N. Otero, M.-T. Pay, V. Raffort, L. Rouil, Y. Roustan, M. Schaap, S. Solberg, M. Theobald, S. Tsyro, M. G. Vivanco, P. Wind.:** The EuroDelta/TFMM trend modeling exercise (1990-2010). *18<sup>th</sup> International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, 9-12 October 2017, Bologna, Italy.
- **Tsyro S., W. Aas, C. Andersson, B. Bessagnet, G. Briganti, T. Butler, A. Cappelletti, A. Colette, F. Couvidat, K. Cuvelier, M. D'Isidoro, H. Fagerli, A. Manders, K. Mar, M. Mircea, N. Ojha, N. Otero, M.-T. Pay, V. Raffort, L. Rouil, Y. Roustan, M. Schaap, S. Solberg, M. Theobald, M. G. Vivanco, P. Wind.:** Multi-model assessment of PM trends in Europe during two decades (1990-2010). *18<sup>th</sup> International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, 9-12 October 2017, Bologna, Italy.

- Theobald M., W. Aas, C. Andersson, B. Bessagnet, G. Briganti, T. Butler, A. Cappelletti, A. Colette, F. Couvidat, K. Cuvelier, M. D'Isidoro, H. Fagerli, A. Manders, K. Mar, M. Mircea, N. Ojha, N. Otero, M.-T. Pay, **V. Raffort**, L. Rouil, **Y. Roustan**, M. Schaap, S. Solberg, S. Tsyro, M. G. Vivanco, P. Wind: An intercomparison of modelled trends of nitrogen and sulphur wet deposition in Europe over the period 1990-2010 in the framework of the EURODELTA/TFMM trend modelling exercise. *18<sup>th</sup> International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, 9-12 October 2017, Bologna, Italy.
- Duclaux O., **V. Raffort**, J. Lemus, P.-Y. Foucher, **Y. Roustan**, A. Armengaud, H. Wortham, C. Juery: The TEMMAS project “Teledetection, Measure, Modeling of Atmospheric pollutants on industrial Sites”: Confrontation of PM analysis with dispersion models (non reactive Lagrangian model and Plume in Grid model with chemical mechanism), *Air & Waste Management Association Conference*, 5-8 June 2017, Pittsburgh, USA.
- Theobald M. R., M. G. Vivanco, W. Aas, M. Adani, U. Alyuz, C. Andersson, A. Balzarini, R. Baró, R. Bellasio, B. Bessagnet, R. Bianconi, J. Bieser, J. Brandt, G. Briganti, A. Cappelletti, J. H. Christensen, G. Ciarelli, A. Colette, F. Couvidat, G. Curci, K. Cuvelier, M. D'Isidoro, J. Flemming, A. Fraser, S. Galmarini, H. García-Gómez, C. Geels, K. M. Hansen, U. Im, P. Jiménez-Guerrero, N. Kitwiroon, A. Manders, M. Mircea, M.-T. Pay, G. Pirovano, L. Pozzoli, M. Prank, **V. Raffort**, **Y. Roustan**, E. Solazzo, S. Tsyro, P. Tuccella, A. Unal, P. Wind: Intercomparison and operational evaluation of the deposition of nitrogen and sulphur in Europe estimated by the air quality models participating in the AQMEII and EURODELTA projects. *14<sup>th</sup> International Atmospheric Sciences and Applications to Air Quality Conference*, 29-31 May 2017, Strasbourg, France.
- **Raffort V.**, **Y. Roustan**, A. Armengaud, G. Courtier, P. Deliot, O. Duclaux, A. Durand, P.-Y. Foucher, M. Fraces, T. Huet, C. Juery, S. Lapeyrie, **C. Legorgeu**, J.-F. Leon, D. Piga, C. Sarrat, B. Temime-Roussel, H. Wortham: Evaluation of a plume-in-grid modeling approach at an industrial site in southeastern France, *International Conference on Aerosol Cycle 2017*, 21-23 March 2017, Lille, France.

### International conference poster presentations

- Carrassi, A. and **M. Bocquet**: Four-dimensional ensemble variational data assimilation and the unstable subspace, *European Geosciences Union General Assembly 2017*, April 23-28, 2017, Vienna, Austria.
- Carrassi, A., **M. Bocquet**, A. Hannart, and M. Ghil: Estimating Model Evidence Using Data Assimilation, *European Geosciences Union General Assembly 2017*, April 23-28, 2017, Vienna, Austria.
- Raanes, P. and **M. Bocquet**: The EnKF-N and inflation, *Emerging Applications of Data Assimilation in the Geosciences*, Lorentz Center, March 13-17, 2017, Leiden, The Netherlands.

- Grudzien, C., A. Carrassi and **M. Bocquet**: Dynamically constrained uncertainty for the Kalman filter in the presence of model error, *Emerging Applications of Data Assimilation in the Geosciences*, Lorentz Center, March 13-17, 2017, Leiden, The Netherlands.
- Raanes, P. and **M. Bocquet**: Gaussian scale mixtures and adaptive inflation for the EnKF, *Data Science & Environment*, July 3-7, 2017, Brest, France.
- **Bocquet, M.**, A. Carrassi, et al.: Four-dimensional ensemble variational data assimilation and the unstable subspace. *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.
- Carrassi, A., **M. Bocquet**, A. Hannart and M. Ghil: Estimating model evidence with data assimilation: the model selection problem *Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate: A Symposium Honoring the Legacy of Anna Trevisa*. October 17-20, 2017, Bologna, Italy.
- Couvidat, F., **Kim, Y., Sartelet, K.** *Modelling the impact of viscosity on Secondary Organic Aerosols formation with the SOAP thermodynamic model inside a 3D air quality model*, European Aerosol Conference, Zürich, Switzerland, 27 Aug- 1 Sept. 2017.
- **Sartelet, K., Kim, Y., Zhu, S., Seigneur, C.,** Moukhtar, S., Favez, O., Gros, V. *Modélisation des particules en Île-de-France*, Journée Scientifique SIRTA 2017, Palaiseau, France, 29 juin 2017.
- **Angot, G., E. Dupont, R. Bresson,** L. Beaudet. Wake and Energy assessment: comparison to Production data. Wind Europe Wind Resource Assessment Workshop 2017, 16-17 Mars, Edimbourg, Ecosse.
- **Angot, G., E. Dupont, R. Bresson,** L. Beaudet. Wake and Energy assessment: comparison to Production data. Wind Energy Science Conference. 26-29 Juin, Copenhagen, Danemark.
- **Kim Y., Y. Wu, C. Seigneur, Y. Roustan,** Multi-scale modeling of urban air pollution: development and application of a Street-in-Grid model, 4th International Conference on Atmospheric Sciences and Application to Air Quality, 29-31 May 2017, Strasbourg, France.
- Quérel A., D. Quélo, **Y. Roustan,** A. Mathieu : Cloud diagnosis impact on deposition modelling applied to the Fukushima accident. *European Geosciences Union General Assembly 2017*, 23–28 Avril, Vienna, Austria.
- Foucher P.-Y., A. Armengaud, G. Courtier, P. Deliot, O. Duclaux, A. Durand, M. Fraces, T. Huet, C. Juery, S. Lapeyrie, **C. Legorgeu,** J.-F. Leon, D. Piga, **V. Raffort, Y. Roustan,** C. Sarrat, B. Temime-Roussel, H. Wortham. The TEMMAS project Teledetection, Measure, Modeling of Atmospheric pollutants on industrial Sites, International Conference on Aerosol Cycle 2017, 21-23 March 2017, Lille, France.

## National conference oral presentations

- **Bocquet, M.:** Principes de la modélisation inverse pour les émissions de polluants, *Journée thématique : Modélisation de la qualité de l'air : des outils aux usages*, June 8, 2017, Paris, France.
- **Seigneur, C.:** Modélisation numérique de la pollution atmosphérique : quels modèles pour quels usages, *Journée thématique – Modélisation de la qualité de l'air : des outils aux usages*, June 8, 2017, Paris, France.

## National conference poster presentations

### Committee activities

#### Editorial boards

- **Bocquet M.**, Associate Editor, “Quarterly Journal of the Royal Meteorological Society”.

#### International conference committees

- **Dupont E.**, review committee of the WindEurope conference, 28-30 November 2017, Amsterdam.

#### National conference committees

#### Conference session chairs

- **Bocquet M.**, chair of session *Towards joint parameter and state estimation*, Emerging Applications of Data Assimilation in the Geosciences, Lorentz Center, Leiden, The Netherlands, March 13-17, 2017.

- **Carissimo B.**, chair of session “*Multi-model assessment of pm trends in Europe during two decades*”. 18 th International conference on harmonisation within atmospheric dispersion modelling for regulatory purposes. Bologna, Italie, October 9-12, 2017

## Scientific committees

- **Bocquet M.**, Scientific committee, European Center for Scientific Computing (CERFACS).
- **Bocquet M.**, Co-chair: Scientific Committee of the "Mathematical and numerical methods" (MANU) activity of the research program, "Les enveloppes fluides et l'environnement" (LEFE) of the National Institute of Earth and Space Science (INSU).
- **Bocquet M., C. Seigneur**, Management Committee, Pierre-Simon Laplace Institute (IPSL).
- **Bocquet M.**, Prix André Prud'homme Committee of the Meteorology and Climate Society.
- **Bocquet M.**, member of the Visiting Committee of the Commissariat à l'énergie atomique et aux énergies alternatives (CEA), Marcoule and Saclay, France. March 27-30, 2017.
- **Carissimo B.**, Scientific committee, International conference on harmonisation within atmospheric dispersion modelling for regulatory purposes.
- **Dupont E., L. Musson-Genon**, Scientific Committee, "Site instrumental de recherche par télédétection atmosphérique" (SIRTA).
- **Sartelet K.**, Scientific Committee of the "Atmospheric Chemistry" (CHAT) activity of the research program "Les enveloppes fluides et l'environnement" (LEFE) of the National Institute of Earth and Space Science (INSU).
- **Sartelet K., C. Seigneur**, Scientific Committee of the DIM (Domaine Intérêt Majeur) of the network QI2 (Réseau Qualité de l'air, Impacts sanitaires et Innovations technologiques et politiques).
- **Sartelet K.**, Scientific Committee of the DIM (Domaine Intérêt Majeur) of the network QI2 (Réseau Qualité de l'air, Impacts sanitaires et Innovations technologiques et politiques).
- **Sartelet K.**, expert in the working group « Particules » of Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (ANSES).
- **Roustan Y.**, Scientific Committee of the OSU (Observatoire des Sciences de l'Univers) EFLUVE (Enveloppes Fluides de la Ville à l'Exobiologie).
- **Seigneur C.**, Scientific Committee of I-Site FUTURE Vague 2 of Université Paris-Est.

- **Seigneur C.**, Working Group on « Knowledge – Information » for the development of the second phase of the national program for climate change adaptation (PNACC-2), Ministry of Environment, Energy, and Sea.
- **Seigneur C.**, Board of CITEPA (Centre Interprofessionnel Technique sur la Pollution Atmosphérique).
- **Seigneur C.**, Scientific Committee of the Copernicus program of the French Ministry in charge of the Environment (Copernicus-MDD).
- **Seigneur C.**, General Assembly of AIRPARIF, the Air Quality Agency for the Paris Region.
- **Seigneur C.**, Scientific and Steering Committee of the Laboratory Federation (LabEx) “Urban Futures”

### Thesis committees (other than Cerea theses)

- **Bocquet M.**, PhD, Luc Charrois, “Assimilation de réflectances satellitaires du domaine visible et proche infrarouge dans un modèle détaillé de manteau neigeux”, University of Grenoble-Alpes, January 5, 2017.
- **Bocquet M.**, referee, PhD, Redouane Lguensat, “Learning from ocean remote sensing data”, IMT Atlantique, Brest, November 22, 2017.
- **Carissimo B.**, PhD, Pierre-Antoine Joulin, “Modélisation des parcs éoliens – Rendement des parcs et impact environnemental”, Université de Toulouse, Novembre, 2017.
- **Carissimo B.**, PhD, Fabien Raoult, “Design d’un échangeur adapté aux écoulements diphasiques pour la brumisation.”, IRSTEA, Octobre, 2017.
- **Sartelet K.**, PhD thesis, Fabien Brosse, « Influence de la couche limite convective sur la réactivité chimique en Afrique de l'Ouest », thèse de doctorat de l'université de Toulouse, 4 décembre 2017.
- **Sartelet K.**, PhD thesis Victor Lannuque « L'aérosol organique secondaire dans les modèles de qualité de l'air : développement d'une paramétrisation sur la base de simulations explicites », *Thèse de doctorat de l'Université Paris Est*, 12 décembre 2017.
- **Sartelet K.**, PhD thesis, Michael Bell « Emission, dispersion and deposition of ammonia from the plot to the landscape scale. » Thèse de doctorat de Agrocampus Ouest, 18 décembre 2017.
- **Roustan Y.**, PhD thesis, Sébastien Ars, « *Caractérisation des émissions de méthane à l'échelle locale à l'aide d'une méthode d'inversion statistique basée sur un modèle gaussien paramétré avec les données d'un gaz traceur.* », Thèse de doctorat de l'université Paris-Saclay, 29 juin 2017.

## HDR committees

- **Bocquet M.**, referee, HdR, Laaziz El Amraoui. “Apport de l’assimilation de données dans la chimie atmosphérique : De l’environnement stratosphérique vers la prévision de la qualité de l’air”, University of Toulouse, January 10, 2017.
- **Bocquet M.**, referee, HdR, Bertrand Bouriquet, “Utilisations de l’assimilation de données pour des applications nucléaires”, Institut National Polytechnique de Toulouse, EdF Saclay, November 20, 2017.
- **Carissimo B.**, referee, HdR, Marie Lothon. Cycle diurne de la couche limite continentale présentée à l’Université Paul Sabatier de Toulouse, March, 2017.

## Defended theses and HDR (CEREA)

- **Haussaire Jean Matthieu**, PhD, **Bocquet M.**, « Méthodes variationnelles d’ensemble itératives pour l’assimilation de données non-linéaire. Application au transport et la chimie atmosphérique », Paris-Est University, June 23, 2017.
- **Raffort Valentin**, PhD, **Seigneur C.**, **Roustan Y.**, « Modélisation des particules primaires et secondaires dans les panaches industriels d’une raffinerie », Paris-Est University, June 27, 2017.
- **Cherin Nicolas**, PhD, **Seigneur C.**, **Roustan Y.**, « Modélisation des flux de dépôts atmosphériques du plomb et du cadmium à l’échelle urbaine », Paris-Est University, February 3, 2017.
- **Thouaron Laëtitia**, PhD, **Seigneur C.**, **Roustan Y.**, « Modélisation dynamique multi-échelle de la pollution atmosphérique en milieu urbain », Paris-Est University, May 30, 2017.
- **Thorey Jean**, PhD, « Prévision d’ensemble par agrégation séquentielle appliquée à la prévision de production d’énergie photovoltaïque », EDF R&D, INRIA, Paris-Centre, September 9, 2017.

## EDUCATIONAL ACTIVITIES

### Teaching

#### École des Ponts ParisTech

- **Bocquet M.**, Introduction à l'assimilation de données (Introduction to data assimilation), Masters M2 OACOS et WAPE.
- **Carissimo B.**, D. Pollack (ENM), Introduction à la météorologie (cours + projet) 1ère année.
- **Carissimo B.**, Mécanique des fluides (remplaçant) 2ème année.
- **Roustan Y., M. Bocquet, J.-M. Haussaire, Y. Liu:** Quantification des incertitudes pour la reconstruction de rejet atmosphérique. Application à Fukushima et Tchernobyl, *Matinales de la recherche de l'École des Ponts ParisTech*, 1<sup>st</sup> March 2017, École des Ponts ParisTech.
- **Roustan Y., Sartelet K.**, Pollution atmosphérique (Air pollution), Master Transports et développement durable (TRADD).
- **Roustan Y., Seigneur C.**, Modélisation numérique, Master Sciences et Génie de l'Environnement (SGE).
- **Seigneur C.**, Aérocontamination, Master Sciences et Génie de l'Environnement (SGE).

#### Other Masters

- **Seigneur C.**, Air pollution chemistry, Master Sciences et Techniques de l'Environnement Urbain (STEU), École Centrale de Nantes.
- **Seigneur C., B. Carissimo**, Atmospheric dispersion, Master Project Management in Energy and Environmental Engineering (PM3E), Institut Mines Télécom Atlantique, Nantes.

#### École Nationale des Travaux Publics de l'État

- **Roustan Y.**, Qualité de l'air et santé, 3<sup>e</sup> année cycle ingénieur.



## DISSEMINATION ACTIVITIES

### Public communications