

Christophe Baehr

Météo-France Research Scientist
Research centre of the French weather service
associated member of the Mathematical Institute of Toulouse

Address: Météo-France/CNRS CNRM/GAME URA 1357
42 avenue de Coriolis, 31057 Toulouse Cedex 1, France
phone +33 561 079 641
email : christophe.baehr@meteo.fr
URL : <http://math.univ-toulouse.fr/~baehr/>

- University Education :
 - Ph D. Applied Mathematics, Toulouse III (2008)
 - Master of Science, Applied Mathematics, option Probability, Toulouse III (2004)
 - B. Sc in Pure Mathematics, Paris VI (1996)
- Positions :
 - Forecaster in Météo-France Aviation forecast centre (1991-1999)
 - Librarian at the Météo-France Research Centre (1999-2001)
 - Engineer in Data Processing for Meteorological and Turbulence Experiments (2001-2003)
 - Research Scientist in Data Processing Meteorological and Turbulence measurements and Meteorological Data Assimilation (2003-)
- Teaching :
 - Lectures in Master degree of Ecology, Toulouse III : Time series, deterministic and random (2005 -)
 - Lectures in Master degree of Ecology, Toulouse III : Introduction to Time series (2005-2009)
 - Lectures in Engineer Degree of National Meteorological School : Data Processing (2008-)
 - Lectures in Master degree of Ecology, Toulouse III : Introduction to Scilab software (2006-)
 - Lectures in Master degree of Ecology, Toulouse III : Introduction to LaTeX (2010-)
 - Lecture for Météo-France Aviation Professional Degree : Dynamics of Signal (2009)
- Research Interest :
 - Applied Probability, Stochastic Algorithm
 - Non-linear filtering, interacting particle approximation

- Kalman filters family
- Interacting Multi-Model Filtering
- Data processing, Fourier and Wavelet Analysis
- Atmospheric Turbulence and dynamical meteorology
- Data Assimilation for Geophysical fields

- Scientific publications :

- **C. Baehr** (2010) : Nonlinear filtering for observations on a random vector field along a random path. Application to atmospheric turbulent velocities, ESAIM: M2AN 44 (5) 921-945 (2010) DOI: 10.1051/m2an/2010047

- O. Pannekoucke and **C. Baehr** (2010) : Kalman filters family in geoscience and beyond chapter in Kalman Filtering, J.M. Gomez Ed. Nova Science Publishers, 2010

- **C. Baehr** and O. Pannekoucke (2010) : Some issues and results on the EnKF and particle filters for meteorological models. Chapter in Chaotic Systems: Theory and Applications, 27-34. DOI No: 10.1142/9789814299725_0004. C. H. Skiadas and I. Dimotikalis Ed. World Scientific, 2010

- M. Lei, **C. Baehr** and P. Del Moral (2010) : Fisher Information Matrix-based Nonlinear System Conversion for State Estimation. IEEE transaction on Control and Automation, 06/2010, 837-841, DOI No: 10.1109/ICCA.2010.5524066.

- M. Lei, P. Del Moral and **C. Baehr** (2010) : Error analysis of approximated PCRLBs for nonlinear dynamics. IEEE transaction on Control and Automation 06/2010, 1988-1993, DOI No: 10.1109/ICCA.2010.5524070.

- S. Rémy, O. Pannekoucke, T. Bergot and **C. Baehr** (2010) : Adaptation of a particle filtering method for data assimilation in a 1D numerical model used for fog forecasting . Accepted with revision for publication in the QJRMS

- **C. Baehr** (2009) : Stochastic modeling and filtering of discrete measurements for a turbulent field. application to measurements of atmospheric wind. Int. Journal Modern Phys. B, 23 (28-29), 5424-5433, DOI No: 10.1142/S0217979209063742

- **C. Baehr** (2008) : Probabilistic models for atmospheric turbulence to filter measurements with particle approximations PhD. Thesis

- **C. Baehr** et al. (1999) : Dynamical Characterization of the FASTEX cyclogenesis cases. Quarterly Journal of the Royal Meteorological Society 125(561): 3469

- **C. Baehr** et al (1999) : Effects of a low-level precursor and frontal stability on cyclogenesis during FASTEX IOP17. Quarterly Journal of the Royal Meteorological Society 125(561): 3415

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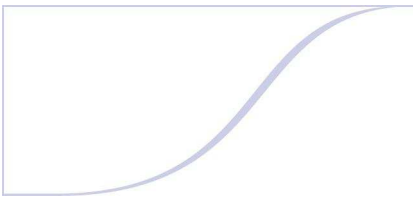
42 avenue de Coriolis 31057 Toulouse Cedex

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Météo-France, établissement public administratif

sous la tutelle du ministère l'Ecologie, de l'Energie, du Développement durable et de la Mer

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All the papers are available on <http://www.math.univ-toulouse.fr/~baehr/>

- Research Management :
 - Member of the Météo-France Research centre GAME scientific committee.
 - Member of the SESAR WP4.7.1 and WP 4.7.2 project management.
- Member of the ANR and Research projects :
 - ANR Research Projects 2009-2011 PREVASSEMBLE; Forecasting and Data assimilation. Subject : Particle Filter in Geosciences Applications with Pr Pierre Del Moral
 - SESAR Joint Undertaking 2009-2016 : SESAR J.U., Météo-France affiliate of the DGAC/DSNA/DTI ; Work Package 4.7.1 and 4.7.2.: New algorithms and stochastic estimators for the weather environment in the optimization of the commercial aircraft trajectory prediction problem
- Tutoring :
 - Météo-France Engineer School, Modeling Engineer 2nd yrs project, January-February 2009, Florian Suzat, Niels Oger and Robin Locatelli sur « Adaptive Data Assimilation using Ensemble Kalman Filter and particle Filters »
 - INSA Engineer School, 4th yrs project, June-September 2009 :
 - Florian Faucher : « Theoretical study and Modelling of the wedging of noisy, fast and drifting instrumental measurements with stable measurements perturbed with Poissonian noises ».
 - Laurent Vezard : « A stochastic Lagrangian Model for humid atmosphere ».
 - Master Research in Applied Mathematics, Toulouse III university, February-July 2010 , Florian Suzat : « Estimation of the atmospheric turbulent parameters using a Lidar Doppler with interacting particle systems ».
 - Master Recherche in Ecology BioStatistics and Modelling Toulouse III University, February-July, Magali Teurlai : « Data Analysis of the Dengue survey in Cambodia from 2002 to 2008: Spatial-temporal study of the disease in the country »

I supervise two fixed term contract researchers:

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- Dr Ming Lei hired with the ANR PREVASSEMBLE funds on « Particle Filter in Geosciences Applications », October 2009 - September 2011
- Dr Nolwen Huet hired by SESAR funds on « New algorithms and stochastic estimators for the weather environment in the optimization of the commercial aircraft trajectory prediction problem », June 2010 - May 2012.

- Workshop Organizations :

- Workshop Organizer 2010. 5th cross-meeting Met/AppliedMath : Air traffic modeling and meteorology (sponsorship SMAI + DSNA/DTI) March 08-09th 2010, Météo-France Toulouse.
- Workshop Organizer 2009. 4th cross-meeting Met/AppliedMath (sponsorship SMAI + IMT) March 25th 2009 at University Toulouse III March 26th at Météo-France Toulouse.
- Workshop Organizer 2008. 3rd cross-meeting Met/AppliedMath: Extreme Events + Ensemble Kalman Filter, September 18-19th 2008, Météo-France Toulouse .
- Workshop Organizer 2007. 2nd cross-meeting Met/AppliedMath: Particle Methods in Fluid Mechanics, March 16th 2007, Météo-France Toulouse.
- Workshop Organizer 2006. 1st cross-meeting Met/AppliedMath: PDF methods for fluids dynamics, March 06th 2006, Météo-France Toulouse .

- Last Invited Conferences :

- PREVASSEMBLE workshop - ENS/LMD Paris, September 8-9th 2010 **C. Baehr** : Non-linear stochastic filtering and its particle approximation in a geophysical context.

- Data assimilation LEFE/ASSIM workshop - INRIA Paris, December 2009. **C. Baehr** : Non-linear stochastic filtering and its particle approximation for meteorological models.

- 2nd Chaotic Modeling and Simulation International Conference - Chania Crete, Greece June 2009, **C. Baehr** and O. Pannekoucke : Some issues and results on the EnKF and particle filters for meteorological models.

- Météo-SMAI-IMT workshop March 25th 2009, **C. Baehr** : Particle Filters and turbulence. Filtering with high dimensional problems.

- Seminar Probability. Toulouse Mathematical Institute, September 2008. **C. Baehr** : Probabilistic models for atmospheric turbulence to filter measurements with particle approximations