International Conference
on Ensemble Methods in Geophysical Sciences
Toulouse, France, 12-16 November 2012

Oral Programme
(jam-09/11/2012)

(Invited presentations: 30 minutes - contributed presentations: 20 minutes)

Monday 12 November

9.00 Registration. Coffee

9.50 Opening

Session 1. *Particle Filters and Applications*

Chair: Gérald Desroziers

10.15 Arnaud Doucet (invited, Department of Statistics, University of Oxford, UK)
Block Sampling Proposals for Particle Filters

10.45 Chris Snyder (invited, National Center for Atmospheric Research, Boulder, USA)
Performance bounds for particle filters using the "optimal" proposal density

11.15 Matthias Morzfeld (Lawrence Berkeley National Laboratory, Berkeley, USA), Alexandre Chorin, Robert Miller, Yvette Spitz and **Brad Weir** (Brad Weir: Oregon State University, Corvallis, USA)
Implicit Sampling for Data Assimilation in Geophysics

11.35 Emmanuel Cosme (Université Joseph Fourier, Grenoble, France) and Chris Snyder
A deterministic, fully non Gaussian analysis scheme for ensemble filters: the Multivariate Rank Histogram Filter

11.55 Christoph Bergemann (Deutsches Zentrum für Luft- und Raumfahrt (DLR), Cologne, Germany)
Particle filter based data assimilation into an air quality model

12.15 Svetlana Dubinkina (Earth and Life Institute, Université catholique de Louvain, Louvain-La-Neuve, Belgium), Hugues Goosse, Violette Zunz and Yoann Sallaz-Damaz
Reconstructions of the climate states over last centuries using particle filtering

12.35 Rihab Mechri (1), Catherine Ottlé (1), Olivier Pannekoucke (2), Abdelaziz Kallel (3) and Ahmed Ben Hamida (4)
(1) Laboratoire des Sciences du Climat et l'Environnement, Institut Pierre Simon Laplace des sciences de l'environnement, Orme des Merisiers, 91191, Gif-sur-Yvette, France
(2) CNRM, Météo-France, 31057, Toulouse, France
(3) High Institute of Electronic and Communication of Sfax, Tunisia

(4) National Engineering school of Sfax, Tunisia
Sub-pixel temperatures estimation based on the assimilation of coarse resolution. Thermal Infrared data using particle filtering

12.55 Lunch break

Session 1. *Particle Filters and Applications* **(continued)**

14.30 Melanie Ades (invited, University of Reading, Reading, UK) and Peter Jan van Leeuwen
Particle filters in high-dimensional systems

15.00 Rafal Wojcik (Massachusetts Institute of Technology, Cambridge, USA), Dennis McLaughlin, Hamed Alemohammad and Dara Entekhabi
Ensemble based fusion of noisy images

15.20 End of session 1

Session 2. *Miscellaneous*

Chair: Tim Palmer

15.20 Ashwanth Srinivasan (University of Miami, Coral Gables, USA), Mohamed Iskandarani, William C. Thacker and Omar M. Knio
Data assimilation using a polynomial chaos based ensemble

15.40 Heikki Järvinen (Finnish Meteorological Institute, Helsinki, Finland), Pirkka Ollinaho, Marko Laine, Antti Solonen and Heikki Haario
Ensemble prediction systems in parameter estimation and forecast skill optimization

16.00 Tea Break

16.30 Frédéric Chevallier (Laboratoire des Sciences du Climat et l'Environnement, Institut Pierre Simon Laplace des sciences de l'environnement, Gif-sur-Yvette, France)
On the parallelization of CO2-flux inversion schemes

16.50 Ralf Giering and Michael Vossbeck (FastOpt, Hamburg, Germany)
Performance gains by computing ensemble responses simultaneously

17.10 Lewis Mitchell: University of Vermon – USA. Lewis.Mitchell@uvm.edu
Georg Gottwald (University of Sydney)
Ensemble data assimilation using stochastic homogenization in a slow-fast system with tipping points

17.30 End of Session

17.30 – 20.00 Cocktail

18.00 – 20.00 Poster Session 1 (authors in attendance 18.00 – 19.30)

20.00 Adjourn

Tuesday 13 November

Session 3. *Probabilistic Prediction*

Chair: Leonard Smith (to be confirmed)

9.00 Tim Palmer (invited, University of Oxford, UK)
Towards the Probabilistic Weather and Climate Prediction Simulator

9.30 Luca Delle Monache (National Center for Atmospheric Research, NCAR, USA), F. Anthony Eckel (National Oceanic and Atmospheric Administration, NOAA, USA), Badrinath Nagarajan (NCAR), Daran Rife (GL Garrad Hassan, USA), Keith Searight (NCAR), Don Berchoff (NOAA), Martin Charron (Environment Canada, Canada), Ronal Frenette (Environment Canada), Jason Knievel (NCAR), Tim Mcclung (NOAA) and John Pace (Army Test and Evaluation Command, USA)
Probabilistic Weather Prediction with an Analog Ensemble

9.50 Michael Scheuerer (Heidelberg University, Germany)
Probabilistic Quantitative Precipitation Forecasting Using Ensemble Model Output Statistics and Minimum CRPS Estimation

10.10 Thomas Hamill (NOAA Earth System Research Lab, Physical Sciences Division, Boulder, USA), Jeffrey S. Whitaker, Don Murray and Gary Bates
NOAA's multi-decadal global ensemble reforecast data set

10.30 Leonard Smith (London School of Economics, UK)
Guidance Information or Probability Forecast: Where do Ensembles Aim?

10.50 Laurent Descamps (Météo-France/DIRIC, Toulouse, France) and Carole Labadie (Météo-France/GMAP/RECYF, Toulouse, France)
Ensemble post-processing methods for short-range ensemble forecasts

11.10 End of Session. Tea Break

Session 4. *Kalman and Hybrid Filters. Theoretical Aspects*

Chair: Etienne Mémin

11.40 Marc Bocquet (invited, 1,2)
(1) Université Paris-Est, CEREA joint laboratory Ecole des Ponts ParisTech and EdF R&D, France.
(2) INRIA, Paris Rocquencourt research centre, France
Accounting for sampling errors in ensemble Kalman filtering

12.10 Shin'ya Nakano and Genta Ueno (The Institute of Statistical Mathematics, Tokyo, Japan)
Hybrid approach of ensemble transform and importance sampling for non-linear data assi

12.30 David Livings and Peter Jan van Leeuwen (University of Reading, Reading, UK)
Weighted Ensemble Square Root Filters for Non-linear, Non-Gaussian, Data Assimilation

12.50 François Le Gland (INRIA Rennes, France) and Valérie Monbet (Université de Rennes 1, France)
Large sample asymptotics for the ensemble Kalman filter

13.10 End of session 1

13.10 Lunch break

Session 5. *Kalman and Hybrid Filters. Continuation and Applications*

Chair: François Le Gland

14.30 Sébastien Beyou, Anne Cuzol and **Étienne Mémin** (INRIA Rennes, France)
Weighted Ensemble Transform Kalman Filter for Image Assimilation

14.50 Stefano Migliorini (University of Reading, Reading, UK)
Information-based data selection for ensemble data assimilation

15.10 Georg Gottwald (University of Sydney, Australia), Lewis Mitchell and Sebastian Reich
Constraining overestimation of error covariances in ensemble Kalman filters

15.30 África Periáñez (Deutscher Wetterdienst, Offenbach am Main, Germany), Hendrik Reich and Roland Potthast
Adaptive Localization for Ensemble Methods in Data Assimilation

15.50 Tuomo Kauranne, Idrissa Amour and Zubeda Mussa (Lappeenranta University of Technology (LUT), Lappeenranta, Finland)
Variational Ensemble Kalman filtering applied to shallow water equations

16.10 Tea Break

16.40 Bertrand Bonan (Laboratoire Jean Kuntzmann, Institut national de recherche en informatique et en automatique, Université Joseph Fourier, INRIA/UJF, Grenoble, France), Maëlle Nodet (Laboratoire Jean Kuntzmann, INRIA/UJF, Grenoble, France) and Catherine Ritz (Laboratoire de Glaciologie et Géophysique de l'Environnement CNRS / UJF Grenoble, France)
Ensemble Methods for ice sheet model initialisation

17.00 Sébastien Barthélémy (Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique, CERFACS, Toulouse, France). Sophie Ricci (CERFACS, Toulouse, France), Olivier Pannekoucke (CNRM-GAME URA 1357, Toulouse, France), Olivier Thual (URA1875/CERFACS and INPT, CNRS, IMFT, Toulouse, France) and Pierre-Olivier Malaterre (UMR G-EAU, Irstea, Montpellier, France)
Data Assimilation On A Flood Wave Propagation Model: Emulation Of An Ensemble Kalman Filter Algorithm

17.20 Umer Altaf (1), Troy Butler (2), Xiaodong Luo (1), Clint Dawson (2), Talea Mayo (2) and Ibrahim Hoteit (1)

(1) King Abdullah University of Science and Technology, Thuwal, Saudi Arabia
(2) Insitute for Computational Engineering and Sciences (ICES), University of Texas at Austin, Austin, Texas 78712, USA
Robust Ensemble filtering for efficient storm surge forecasting

17.40 George Craig (Ludwig-Maximilians-Universität München, Germany), M. Würsch, H. Lange and M. Haslehner
Applying an ensemble Kalman filter to complex convective cloud fields in a hierarchy of models

18.00 End of Session

18.00 – 20.00 Poster Session 2 (authors in attendance 18.00-19.30)

20.00 Adjourn

Wednesday 14 November

Session 6. *Ensemble Variational Assimilation*

Chair: Chris Snyder

9.00 Andrew Lorenc (invited, Met Office, Exeter, UK), Neill Bowler and Peter Jermey
4D-Ensemble-Var - a Development Path for the Met Office's Data Assimilation

9.30 Gérald Desroziers, Jean-Thomas Camino and Loïk Berre (CNRM-GAME, Météo-France and CNRS, Toulouse, France)
A possible implementation of the 4D-Var based on a 4D-ensemble

9.50 Milija Zupanski (Colorado State University, USA)
Towards the development of hybrid variational-ensemble data assimilation: Minimization, Hessian preconditioning, and static error covariance model

10.10 Thomas Auligné (National Center for Atmospheric Research, Colorado, USA)
An Integrated Ensemble/Variational Hybrid Data Assimilation System

10.30 Thibaut Montmerle (CNRM-GAME, Météo-France and CNRS, Toulouse, France) and Pauline Martinet
Forecast errors in clouds and precipitation: diagnosis and modelling for the assimilation of cloudy radiances and radar data in the AROME model at convective scale

10.50 Tea Break

11.20 Stephen Pring (Met Office, Exeter, UK) and David Fairbairn
Comparing 4D-VAR and ensemble-VAR assimilation methods within toy models

11.40 Mohamed Jardak (Laboratoire de Météorologie Dynamique, ENS, Paris, France) and Olivier Talagrand
Bayesianity of Ensemble Variational Assimilation

12.00 Yann Michel: CNRM-GAME, Météo-France and CNRS – FRANCE.
Applying tests of univariate Gaussianity on short range forecasts from an ensemble of variational assimilations.

12.20 Ricardo Todling: NASA/GMAO – USA.
A. El Akkraoui, R. M. Errico, J. Guo, J. Kim, D. Kliest, D. F. Parrish, M. Suarez, A. Trayanov, Yannick Tremolet, J. Whitaker and B. Zhang
Experimenting with the GMAO 4D Data Assimilation

12.40 Max Yaremchuk (Naval Research Laboratory, Stennis Space Center, USA) and Dmitri Nechaev
Localization of the ensemble covariances using the diffusion operator approach

13.00 End of Session. Adjourn

13.00 Lunch break (inside the Conference centre)

14.00 Bus to the town centre

16.00 Guided tour (meeting in front of the "Donjon")

20.00 Diner at "Chez Jules" restaurant

Thursday 15 November

Session 7. *(Quasi-)Operational Ensemble Prediction Systems*

Chair: Leonard Smith

9.00 Roberto Buizza (invited, ECMWF, Reading, UK) (ECMWF, www.ecmwf.int)
20 years of ensemble prediction at ECMWF

9.30 Carole Labadie (Météo-France, Toulouse, France) and Descamps, P. Cebron, Y. Michel, L. Raynaud, M. Boisserie, L. Berre, G. Desroziers and E. Bazil.e
Initialization with ensemble data assimilation and singular vectors in PEARP, the Météo-France ensemble prediction system

9.50 Jing Chen (The Center of Numerical Weather Prediction, China Meteorological Administration, Beijing, China), TIAN Hua, DENG Guo, LI Xiaoli, GONG Jiandong, LI Yinglin, WANG Xiaocong and HU Jiangkai
The Introduction of Ensemble Prediction System at CMA and its application in monsoon season

10.10 Masashi Ujiie (Japan Meteorological Agency, Tokyo, Japan), Haruki Yamaguchi, Masakazu Higaki and Masayuki Kyouda
Current status and development of medium range EPS at JMA

10.30 Christoph Gebhardt (Deutscher Wetterdienst, Offenbach am Main, Germany), Susanne E. Theis, Zied Ben Bouallegue, Andreas Roepnack, Nina Schuhen and Michael Buchhold
COSMO-DE-EPS – an operational convection-permitting ensemble prediction system for the atmosphere

10.50 Tea Break

11.20 Jonathan Flowerdew (Met Office, Exeter, UK)
MOGREPS ensemble forecasting

11.40 Piers Buchanan (Met Office, Exeter, UK) and Ken Mylne
The Use of Met Office Ensemble Model data to Generate Severe Weather Forecasts

12.00 Christopher Cunningham: Center for Weather Forecast and Climate Studies (CPTEC/INPE) Brazil. christopher.cunningham@cptec.inpe.br
Jose Paulo Bonatti, Pedro Leite da Silva Dias
Improvements of the eigenvector method to produce a ensemble of perturbed initial conditions for the CPTEC Ensemble Prediction System

12.20 François Bouttier (Météo-France CNRM-GAME 42 Av Coriolis 31057 Toulouse, France), Olivier Nuissier, Laure Raynaud and Benoît Vié
Regional short-range ensemble prediction with the AROME atmospheric system

12.40 End of Session. Lunch Break

Session 8. *(Quasi-)Operational Assimilation Systems*

Chair: Tom Hamill

14.30 Loïk Berre (invited, CNRM-GAME, Météo-France and CNRS, Toulouse, France), Gérald Desroziers, Hubert Varella, Laure Raynaud, Carole Labadie and Laurent Descamps
Variational ensemble data assimilation at Météo-France for covariance modelling and ensemble prediction

15.00 Anna Shlyaeva (Hydrometeorological Research Center of Russia, Moscow, Russia), Vasily Mizyak and Mikhail Tolstykh
Local Ensemble Transform Kalman Filter assimilation scheme for the global atmospheric model SL-AV

15.20 Amal El Akkraoui (NASA/Global Modelling and Assimilation Office/Science Systems and Applications, Inc., Greenbelt, USA) and Ricardo Todling
The GMAO 3DVAR-Hybrid Data Assimilation System

15.40 Yonghong Yin (The Centre for Australian Weather and Climate Research, and the Bureau of Meteorology, Melbourne, Australia), Oscar Alves and Debra Hudson
Ensemble data assimilation/initialisation for intra seasonal to seasonal prediction using POAMA at the Bureau of Meteorology

16.00 Tea Break

16.30 Pau Escribà (ECMWF, Reading, UK, and Agencia Estatal de Meteorología, Barcelona, Spain), Massimo Bonavita, Mats Hamrud, Lars Isaksen and Paul Poli
LETKF compared to 4DVAR for assimilation of surface pressure observations in IFS (ECMWF)

16.50 Nils Gustafsson (Swedish Meteorological and Hydrological Institute, Norrköping, Sweden) and Jelena Bojarova (Norwegian Meteorological Institute, Oslo, Norway)
Sensitivity to the ensemble generation approach in hybrid 4D-Variational ensemble data assimilation scheme in HIRLAM

17.10 Christoph Schraff (Deutscher Wetterdienst, Offenbach am Main, Germany), Hendrik Reich and Andreas Rhodin
Development of a LETKF for Km-scale Ensemble Data Assimilation for the COSMO model

17.30 End of session

17.30 Session 9. *Identification and Representation of Model Errors*

Chair: Marc Bocquet

17.30 Carla Cardinali (ECMWF, Reading, UK), Nedjeljka Zagar, Gabor Radnoti and Roberto Buizza
Representing model uncertainties in the ensemble data assimilation

17.50 Adjourn

Friday 16 November

Session 9. *Identification and Representation of Model Errors (continued)*

Chair:Marc Bocquet

9.00 Renaud Marty: Chaire de recherche EDS en prévisions et actions hydrologiques, Département de génie civil et de génie des eaux, Université Laval, Canada. renaud.marty.1@ulaval.ca
Vincent Fortin: Recherche en prévision numérique environnementale, Environnement Canada, Dorval, Canada
Heri Kuswanto: Department of Statistics, Faculty of Mathematics and Natural Science, Institute Technology of Sepuluh Nopember (ITS), Surabaya 60111, East Java, Indonesia
Anne-Catherine Favre: Grenoble-INP/ENSE3, Laboratoire d'Etude des Transferts en Hydrologie et Environnement (LTHE), UMR 5564, Grenoble, F-38041, France
Eric Parent: Dpt. of Statistics, UMR518 AgroParis- Tech/INRA, 16 rue C Bernard, 75005 Paris, France
Bayesian Processor of Ensemble Members: combining the Bayesian Processor of Output with Bayesian Model Averaging for reliable weather forecasting

9.20 So-Young Ha (National Center for Atmospheric Research, Boulder, USA), Chris Snyder and Judith Berner
Model error representation in mesoscale WRF-DART cycling

9.40 Alison Rudd (University of Reading, Reading, UK), Laura Baker, Stefano Migliorini and Ross Bannister
Representation of model error in convective-scale ensembles

10.00 Kirstin Kober (Meteorologisches Institut Ludwig-Maximilians-Universität München, Germany), George C. Craig, Tobias Selz and Annette Förster
Stochastic parameterisations in multi-scale ensemble systems

10.20 Alfons Callado (Spanish Meteorological Agency, Barcelona, Spain), G. Shutts, J--J. Morcrette and R. Forbes
Stochastic Perturbation of Physical Parameterization Tendencies and Model Uncertainty

10.40 End of Session. Tea Break

Session 10. *Further Developments*

Chair: Martin Leutbacher

11.10 Hailiang Du, Leonard A. Smith and **Emma Suckling** (The London School of Economics and Political Science, UK)
Pseudo-orbit Gradient Descent Ensemble Method

11.30 Vivien Mallet (INRIA & CEREA, France), Sergiy Zhuk (IBM Research, Dublin, Ireland) and Alexander Nakonechniy (Taras Shevchenko National University of Kiev, Kiev, The Ukraine)
Ensemble forecast of analyses with uncertainty estimation

11.50 C. Santos: Agencia Estatal de Meteorología (AEMET) – Spain. csantosb@aemet.es
 A. Amo, E. Abellán, A. Callado, P. Escribà, J. Sancho, J. Simarro
AEMET-SREPS: past, present and future

12.10 Ernest Koffi (Laboratoire des Sciences du Climat et l'Environnement, Institut Pierre Simon Laplace des sciences de l'environnement, Gif-sur-Yvette, France), S. Kuppel, **P. Peylin**, F. Chevallier and D. Santaren
Variational vs. ensemble strategies to optimize the uncertain parameters of a terrestrial biosphere model

12.30 Ehouarn Simon: NERSC - Norway.
Annette Samuelsen, Laurent Bertino, Dany Dumont
Estimation of positive sum-to-one constrained parameters with ensemble-based Kalman filters: application to an ocean ecosystem model

12.50 End of Session. Lunch Break

Session 11. *Evaluation and Validation*

Chair: Andrew Lorenc

14.30 Mark Buehner (invited, Environment Canada, Canada), Josée Morneau and Cécilien Charrette
A comparison of Ensemble-Variational data assimilation and 4D-Var for global deterministic weather prediction

15.00 Simon Lang and Martin Leutbecher (ECMWF, Reading, UK)
On the reliability of ensemble spread generated by singular vectors

15.20 Matthias Grzeschik (WESS-Water & Earth System Science Competence Center c/o University of Tübingen, Germany), Thomas Schwitalla, Hans-Stefan Bauer and Volker Wulfmeyer
Capability of WRF 3D-Var and DART EnKF to represent covariance structures

15.40 Giovanni Leoncini (Met Office, Exeter, UK) and **Nigel. Roberts**
Convective scale ensemble at the Met Office Part II: new tools for assessment and evaluation

16.00 Tilmann Gneiting (Heidelberg University, Germany), Roman Schefzik and Thordis Thorarinsdottir
Ensemble copula coupling: Towards physically consistent, calibrated probabilistic forecasts of spatio-temporal weather trajectories

16.20 End of Session. Closure of Conference

16.30 End of Conference