

## **Dr. Yannick Trémolet**

Dr. Yannick Trémolet received his PhD in Applied Mathematics from the Université Joseph Fourier in Grenoble, France in 1995. His PhD work comprised the study of parallel algorithms to solve the variational data assimilation optimization problem.

After obtaining his PhD, from 1995 to 1999, he worked at the National Centers for Environmental Prediction (NCEP/EMC). At NCEP, he mostly worked on the development of a distributed memory version of the operational global spectral model and some of the numerical aspects of the model like the use of a reduced grid. He also developed a tangent linear and adjoint version of the dynamical core of this model.

In 1999, he joined ECMWF where he has worked in the data assimilation section of the research department. He has worked on several aspects of the operational 4D-Var system such as the evaluation of the use of a weak constraint digital filter for initialization, the evaluation of the accuracy of the tangent linear hypothesis, the handling of trajectories for linearization or the convergence of the incremental 4D-Var algorithm. More recently, his research has focused on the development of a weak constraint 4D-Var system accounting for model error in the data assimilation process. He has developed several formulations of the weak constraint 4D-Var. One is adapted to capture the systematic component of model error and a more general formulation better suited for longer assimilation windows is in development. The two most important aspect of this work are the formulation of the model error covariance matrix and of a new formulation of the optimization problem that exploits parallelism in the time dimension of the assimilation window. He is also interested in modern programming techniques and the use of object-oriented technology on supercomputers, in particular for meteorological applications.

In 2007, he spent one year at the Global Modeling and Assimilation Office (NASA/GMAO) where he worked on the development of a 4D-Var version of the Grid-point Statistical Interpolation data assimilation system (GSI). He also developed an adjoint of the GSI (3D-Var and 4D-Var) used for observation sensitivity and impact studies.