



Particle filtering in strongly non-linear ecosystem modelling

S. N. Losa(1), J. Schröter(1), M. Wenzel (1)

Alfred Wegener Institute for Polar and Marine Research (Svetlana.Losa@awi.de)

We investigate advantages and specific difficulties in implementation of particle filters when assimilating data into strongly non-linear and non-Gaussian systems. With respect to the last circumstance, a Sequential Importance Resampling (SIR) filter seems to be of a great advantage since the filter updates probability of the particles (according to their agreement with the assimilated data) and thus, allows one to use the full forecast and data errors statistics. Still the most challenging thing in such a filtering is sampling the particles which approximate the continuous probability density function (pdf) evolved according to a stochastic dynamical model. We consider different sampling strategies which depend on our prior knowledge of the system and determine the filter performance cost and quality. All the experiments have been carried out with an ocean biogeochemical model which indeed is an example of a non-Gaussian system.