

Estimating Atmospheric Forcing Errors in Ocean Data Assimilation using the Representer Method of 4DVAR

Hans Ngodock^a and Matthew Carrier^b

^a*Ocean Data Assimilation and Probabilistic Prediction, Naval Research Laboratory, USA,*
hans.ngodock@nrlssc.navy.mil

^b*Ocean Data Assimilation and Probabilistic Prediction, Naval Research Laboratory, USA*

In this study, a weak constraint assimilation is carried out using the Navy Coastal Ocean Model 4DVAR to fit the ocean observations collected in the Monterey Bay, California region while minimizing/estimating the errors in both the initial conditions and atmospheric forcing fields. The cost function is minimized through the representer algorithm, which expresses the optimal assimilation solution as a first guess plus a finite linear combination of representer functions, one per datum. The method allows the control of both initial conditions and model errors while minimizing the cost function in the observations space. Retrieved corrections to the atmospheric forcing are validated by adding them to the prior estimates and integrating the nonlinear model, and comparing the resulting solution to independent and non-assimilated observations. Examples of numerical experiments will be shown.