Adjoint Sensitivity Analysis of Large Scale Ocean Biases

ELISABETH REMY^{1,2}

¹CERFACS, 42 Avenue Gaspard Coriolis, 31057 Toulouse Cedex 01 ²MERCATOR-OCEAN, Parc Technologique du Canal, 8-10 rue Hermès, 31520 Ramonville Saint Agne, France

Mercator-Ocean is a french ocean forecasting center producing each week, two weeks forecasts for the global ocean and the Atlantic Ocean. In order to improve the analysis and forecasting systems, different validation strategies are developed. Advanced approaches based on ensemble and adjoint tools are also explored. We will discuss the use of the adjoint for a sensitivity analysis of the observed biases to the ocean state initial conditions and atmospheric forcing fields. This approach is applied to the Mercator-Ocean ¹/₄° global ocean reanalysis, GLORYS, in order to understand the origin of the identified large scale biases in temperature and salinity at different depths. The ocean model is NEMO, its adjoint is now available. This sensitivity experiment is also a challenging application of this newly developed version of the code: the global ocean eddy permitting configuration at 1/4° is computationally demanding. The first results will be presented. Adjoint sensitivity analysis in an operational ocean context is recent compared to weather forecasting centers.