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In this talk, we introduce some recent progress on the continuous data assimilation algorithm in geophysical and fluid dynamics. This algorithm shows great potential in the application in the area such meteorology and geophysics. In particular, we show the analysis of this algorithm for the three-dimensional primitive equations of the ocean, i.e., we prove that the assimilated solution converges to the reference solution in both L^2 and L^6 norms at exponential rates in time. Also, we present the first three-dimensional numerical simulations of this algorithm on super-computer with more than one thousand cores, under the context of Navier-Stokes equations. (Received September 19, 2017)