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Chuntian Wang* (wang211@uemail.iu.edu), 831 East 3rd St, Bloomington, IN 47405. *Time Discrete Approximation of Weak Solutions for Stochastic Equations of Geophysical Fluid Dynamics and Applications.*

As a first step towards the numerical analysis of the stochastic primitive equations of the atmosphere and oceans, we study their time discretization by an implicit Euler scheme. From deterministic viewpoint the 3D Primitive Equations are studied with physically realistic boundary conditions. From probabilistic viewpoint we consider a wide class of nonlinear, state dependent, white noise forcings. The proof of convergence of the Euler scheme covers the equations for the oceans, atmosphere, coupled oceanic-atmospheric system and other geophysical equations. We obtain the existence of solutions weak in PDE and probabilistic sense, a result new to the best of our knowledge. (Received September 12, 2014)