

Title:

Numerical schemes for the 2d Navier-Stokes equations: Strong rate of convergence.

Abstract:

We consider a time discretization scheme of Euler type for the 2d stochastic Navier-Stokes equations on the torus. We prove a mean square rate of convergence. This refines previous results established with a rate of convergence in probability only. Using exponential moment estimates of the solution of the Navier-Stokes equations and a convergence of a localized scheme, we can prove strong convergence of fully implicit and semi-implicit time Euler discretization and also a splitting scheme. The speed of convergence depends on the diffusion coefficient and the viscosity parameter.