
Stochastic Navier-Stokes Equations for Compressible Fluids

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Abstract

We study the Navier-Stokes equations governing the motion of isentropic compressible fluid in three dimensions driven by a multiplicative stochastic forcing. In particular, we consider a stochastic perturbation of the system as a function of momentum and density and establish existence of the so-called finite energy weak martingale solution under the condition that the adiabatic constant satisfies $\gamma > 3/2$. The proof is based on a four layer approximation scheme together with a refined stochastic compactness method and a careful identification of the limit procedure.

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