

Statistical Solutions for a Nonautonomous Modified Swift-Hohenberg Equation

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Abstract

We consider the nonautonomous modified Swift-Hohenberg equation $\frac{du}{dt} + \Delta^2 u + 2\Delta u + au + b|\nabla u|^2 + u^3 = g(t, x)$ on a bounded smooth domain $\Omega \subset \mathbb{R}^n$ with $n \leqslant 3$. We show that, if $|b| < 4$ and the external force g satisfies some appropriate assumption, then the associated process has a unique pullback attractor in the Sobolev space $H_0^2(\Omega)$. Based on this existence, we further prove the existence of a family of invariant Borel probability measures and a statistical solution for this equation.

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