

# Convergence of attractors for a nonautonomous perturbed semilinear parabolic equation

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## Abstract

We consider the initial and boundary value problem governed by the equation  $u_t - \Delta u = f_0(u)$  on a bounded domain  $\Omega \subset \mathbb{R}^3$  with the homogeneous Dirichlet conditions and cubic nonlinearity  $f_0$ . We compare the global attractor of the semiflow governed by the above equation with uniform, pullback, and cocycle attractors of the process governed by its nonautonomous perturbation  $\epsilon u_{tt} + u_t - \Delta u = f_\epsilon(t, u)$ , where the type of equation changes from parabolic to hyperbolic. We prove that all three types of nonautonomous attractors converge both upper- and lower-semicontinuously to the global attractor for the unperturbed problem as  $\epsilon \rightarrow 0$ .

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