## Existence and long-time behavior of solutions to the velocity-vorticity-Voigt model of the 3D Navier-Stokes equations with damping and memory

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## Abstract

In this paper, we study the long-time dynamical behavior of the non-autonomous velocity-vorticity-Voigt model of the 3D Navier-Stokes equations with damping and memory. We first investigate the existence and uniqueness of weak solutions to the initial boundary value problem for above-mentioned model. Next, we prove the existence of uniform attractor of this problem, where the time-dependent forcing term  $f \in L^2_b(\mathbb{R}; H^{-1}(\mathbb{O}))$  is only translation bounded instead of translation compact. The results in this paper will extend and improve some results in Yue, Wang (Comput. Math. Appl., 2020) in the case of non-autonomous and contain memory kernels which have not been studied before.

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