

Global Solutions to a Keller–Segel–Navier–Stokes System with Potential Consumption

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Abstract

The present work deals with a Keller–Segel–Navier–Stokes system with potential consumption, under homogeneous Neumann boundary conditions for cell density and chemical signal, and Dirichlet type for the velocity field, over a bounded three-dimensional domain. The paper aims to develop a time discretization scheme converging to weak solutions of the system, which are uniformly bounded at infinite time. While global existence results are already known for simplified cases, either in absence of fluid flow or for linear consumption, the existence of global weak solutions for the fully coupled system with potential consumption has remained as an open problem.

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