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On a Reaction-Diffusion-Advection System Modeling Bacterial Flocculation

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Abstract

We were concerned with a diffusive flocculation model in a heterogeneous environment. We proved global existence and coexistence of species in the medium. Stability of the washout steady state was shown by analyzing the sign of the principal eigenvalue corresponding to the trivial solution. And, by numerical simulations, we show the effect of diffusion coefficient on the coexistence of microbial species to illustrate the convergence towards the washout steady state as diffusion becomes small or towards the coexistence of species as diffusion becomes large.

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References

- [1] R. Fekih-Salem, J. Harmand, C. Lobry, A. Rapaport, T. Sari, *J. Math. Anal. Appl.* 397, Issue 1, (2013), 292-306.
- [2] S. Zermani, N. Abdellatif, *J. Math. Anal. Appl.* 506, (2022), 125484.