Numerical investigation of long range segregation models

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Abstract

We investigate numerical approximation for a class of elliptic and parabolic competition-diffusion systems of long range segregation models for two and more competing species.

We prove that as the competition rate goes to infinity the solution converges, along with suitable sequences, to a spatially long range segregated state satisfying some free boundary problems. Also we study the long term behavior in time for the parabolic system.

Moreover, we use properties of limiting problem to construct efficient numerical simulations for elliptic and parabolic systems.