

Spatio-Temporal Chaos in Chemotaxis Models

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A chemotaxis model with growth

$u(x, t)$: cell density

$v(x, t)$: chemical signal

$$\begin{aligned}u_t &= \nabla (D\nabla u - \chi u \nabla v) + ru(1 - u), \\v_t &= \Delta v + u - v.\end{aligned}\tag{1}$$

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- ▶ Fix $\chi = 10, D = 1$ and vary L :

Fourier Modes of Step Function

