Stability of stationary solutions to reaction-diffusion-ODE systems

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We give a survey of stability results of reaction-diffusion-ODE systems, which consists of a single reaction-diffusion equation coupled with ordinary differential equations. Reaction-diffusion-ODE systems arise, for example, from modeling of interactions between cellular processes and diffusing growth factors.

We have showed that all regular stationary solutions are unstable, which implies that reaction-diffusion-ODE systems cannot exhibit spatial patterns and possible stable stationary solutions have to be singular or discontinuous. In this talk, we would like to show sufficient conditions for existence and stability of discontinuous stationary solutions.

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