

## Asymptotics and Stability of Large $L^\infty$ -modulations of Wave Trains in Reaction-diffusion Systems

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### Abstract

We study reaction-diffusion systems on the extended line admitting a periodic traveling-wave solution  $\phi_0$  which is diffusively spectrally stable. Having a solution  $u$  and a phase modulation  $\gamma$  at hand, we focus on the long-standing question of how the modulated perturbation  $u(\cdot, t) - \phi_0(\cdot + \gamma(\cdot, t))$  with respect to suitable norms and initial conditions evolves in time.

I will give an overview of existing answers and present our new result, outlining main aspects and challenges of its proof. The essential extension consists of both lifting any localization requirement on  $\partial_x \gamma$  and removing the smallness assumption on  $\|\gamma(\cdot, t)\|_{L^\infty}$ . Our method is robust and we expect that it can be applied to other semilinear (even non-parabolic) systems.