

Travelling waves in a convection-diffusion equation

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Abstract: We will discuss existence and stability of travelling waves for a nonlinear convection diffusion equation in the 1-D Euclidean space. The diffusion coefficient depends on the gradient in analogy with the p -Laplacian and may be degenerate or singular. We establish unconditional stability with respect to initial data perturbations in $L^1(\mathbb{R})$. Although our solutions typically do not belong to $L^1(\mathbb{R})$, their difference usually does belong there; therefore, the $L^1(\mathbb{R})$ metric is of crucial importance in our approach.

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