Existence and multiplicity for implicit discretization of Nagumo RDE on unbounded domain via variational methods

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We analyze existence and uniqueness of $\ell^2$-solutions of the implicit discrete Nagumo reaction-diffusion equation. We study the infinite-dimensional problem variationally and describe corresponding potentials which have either the convex or mountain pass geometry. Consequently, we show that the implicit Nagumo equation has a solution for all reaction parameters $\lambda \in \mathbb{R}$, at least for small time discretization steps $h$. Moreover, the solution is unique in the bistable case, $\lambda > 0$. This is a joint work with Petr Stehlík.

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References