

Godoy, T.; Kaufmann, U.

Periodic parabolic problems with nonlinearities indefinite in sign. (English) Zbl 1146.35051
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Authors' abstract: Let $\Omega \subset \mathbb{R}^N$ be a smooth bounded domain. We give sufficient conditions (which are also necessary in many cases) on two nonnegative functions a, b , that are possibly discontinuous and unbounded, for the existence of nonnegative solutions for semilinear Dirichlet periodic parabolic problems of the form $Lu = \lambda a(x, t) u^p - b(x, t) u^q$ in $\Omega \times \mathbb{R}$, where $0 < p, q < 1$ and $\lambda > 0$. In some cases we also show the existence of solutions u_λ in the interior of the positive cone and that u_λ can be chosen such that $\lambda \rightarrow u_\lambda$ is differentiable and increasing. A uniqueness theorem is also given in the case $p \leq q$. All results remain valid for the corresponding elliptic problems.

Reviewer: [Nils Ackermann \(México\)](#)

MSC:

- [35K60](#) Nonlinear initial, boundary and initial-boundary value problems for linear parabolic equations
- [35K55](#) Nonlinear parabolic equations
- [35B10](#) Periodic solutions to PDEs
- [35J65](#) Nonlinear boundary value problems for linear elliptic equations

Cited in **3** Documents

Keywords:

[periodic nonnegative solution](#); [indefinite nonlinearity](#); [semilinear Dirichlet periodic parabolic problems](#)

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