

Existence and regularity results to the generalized Emden–Fowler equation with irregular data

Agnieszka Kałamajska

Institute of Mathematics, University of Warsaw, Poland

kalamajs@mimuw.edu.pl

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We deal with the generalized Emden–Fowler equation $f''(x) + g(x)f^{-\theta}(x) = 0$, where $\theta \in \mathbf{R}$, $x \in (a, b)$, g belongs to $L^p((a, b))$. We obtain *a priori* estimates for the solutions, information about their asymptotic behavior near boundary points and some existence results. As a tool we use new nonlinear variants of first and second order Poincaré inequalities, which are based on strongly nonlinear multiplicative inequalities obtained recently in [1].

References

- [1] Kałamajska, A. and Peszek, J., *On some nonlinear extensions of the Gagliardo–Nirenberg inequality with applications to nonlinear eigenvalue problems*. Asymptotic Analysis, Volume 77, Number 3-4 (2012), 169–196.
- [2] A. Kałamajska and K. Mazowiecka, *Some regularity results to the generalized Emden–Fowler equation with irregular data*, to appear in Mathematical Methods in the Applied Sciences.