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Index of solution set for perturbed Fredholm equations and existence of periodic solutions for delay differential equations. (English) [Zbl 1055.34133](#)

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The authors consider the topological index of the solution set of Fredholm equations with f -condensing-type perturbations and apply this to investigate periodic solutions of delay differential equations of the form

$$a(t, x(t), x(t - \tau), x'(t), x'(t - \tau)) = b(t, x(t), x(t - \tau), x'(t), x'(t - \tau)),$$

where the functions a, b are ω -periodic in the first variable and the delay τ is commensurable with ω , that is there exists $\tau_0 > 0$ such that $p\tau_0 = \omega$ and $k\tau_0 = \tau$ for some integers p and k , $p > k$. As an application, the existence of a periodic solution for a nonlinear differential equation is considered.

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MSC:

[34K13](#) Periodic solutions to functional-differential equations

[47H11](#) Degree theory for nonlinear operators

[47H09](#) Contraction-type mappings, nonexpansive mappings, A -proper mappings, etc.

Keywords:

[index of solution set](#); [f-condensing map](#); [measure of noncompactness](#); [delay differential equation](#)

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