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ON A PROPERNESS METHOD FOR FREE VIBRATIONS PROBLEM

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Abstract. This paper is concerned with the existence of nontrivial periodic solutions (free vibrations) of semilinear wave equations of the form

$$\begin{cases} u_{tt} - u_{xx} + g(t,x,u) = f(t,x) \\ u(t,0) = u(t,\pi) = 0, & t \in \mathbf{R} \\ u(t+2\pi,x) = u(t,x), & t \in \Omega \end{cases}$$

where $\Omega = (0,2\pi) \times (0,\pi)$. It is used Liapunov-Schmidt method to obtain solutions of this problem as a limit of solutions of related problems in some finite dimensional spaces which can be solved. This problems will be considered with approximation schemes and corresponding mappings called approximation-proper operators.

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