Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5)
Vol. VIII (2009), 117-141

Periodic solutions of forced Kirchhoff equations

PIETRO BALDI

Abstract. We consider the Kirchhoff equation for a vibrating body, in any dimension, in the presence of a time-periodic external forcing with period $2\pi/\omega$ and amplitude ε. We treat both Dirichlet and space-periodic boundary conditions, and both analytic and Sobolev regularity.

We prove the existence, regularity and local uniqueness of time-periodic solutions, using a Nash-Moser iteration scheme. The results hold for parameters (ω, ε) in a Cantor set with asymptotically full measure as $\varepsilon \to 0$.

Mathematics Subject Classification (2000): 35L70 (primary); 45K05, 35B10, 37K55 (secondary).