

Ekeland, I.; Hofer, H.

Subharmonics for convex nonautonomous Hamiltonian systems. (English) Zbl 0601.58035
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Denote by J the standard symplectic matrix in \mathbb{R}^{2n} and let $H \in C^2(\mathbb{R} \times \mathbb{R}^{2n}, \mathbb{R})$ be T -periodic in the first variable. In this paper we investigate the existence of kT -periodic solutions of the time dependent Hamiltonian system

$$(HS)_k \quad -J\dot{x} = H'(t, x), \quad x(0) = x(kT),$$

where $k \in \mathbb{N}$. A solution of $(HS)_k$ for $k \geq 2$ is called a subharmonic. Clearly, a solution of $(HS)_k$ will also be a solution of $(HS)_{2k}$, $(HS)_{3k}$, etc. We show under a convexity assumption on H and a suitable asymptotic behaviour of H that for every $k \in \mathbb{N}$ there is a solution x_k of $(HS)_k$ such that the x_k , $k \in \mathbb{N}$, are pairwise geometrically distinct.

MSC:

- 37J45 Periodic, homoclinic and heteroclinic orbits; variational methods, degree-theoretic methods (MSC2010)
- 34C25 Periodic solutions to ordinary differential equations
- 58E05 Abstract critical point theory (Morse theory, Lyusternik-Shnirel'man theory, etc.) in infinite-dimensional spaces

Cited in **2** Reviews
Cited in **30** Documents

Keywords:

time dependent Hamiltonian system

Full Text: [DOI](#)

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