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Periodic solutions of non-autonomous Hamiltonian systems with symmetries. (English)

Zbl 0794.58037

J. Reine Angew. Math. 451, 149-159 (1994).

Consider the non-autonomous Hamiltonian system $\dot{u} = J\nabla H(t, u)$ where the Hamiltonian $H \in C^1(\mathbb{R} \times \mathbb{R}^{2N}, \mathbb{R})$ is 1-periodic in t and satisfies certain growth conditions with respect to u ; in particular, H is superquadratic. We prove the existence of an unbounded sequence of 1-periodic solutions provided H is invariant under a fairly general class of linear symplectic group actions on \mathbb{R}^{2N} . For the proof we use variational methods. Critical points of the corresponding strongly indefinite functional are obtained via a Galerkin type approximation leading to weakly indefinite functionals. This makes the argument rather elementary compared with related approaches of *V. Benci* [*Trans. Am. Math. Soc.* 274, 533-572 (1982; Zbl 0504.58014)].

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MSC:

37G99 Local and nonlocal bifurcation theory for dynamical systems

58E05 Abstract critical point theory (Morse theory, Lyusternik-Shnirel'man theory, etc.) in infinite-dimensional spaces

Cited in 16 Documents

Keywords:

critical points; Hamiltonian; 1-periodic solutions

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