

**SUBHARMONIC SOLUTIONS  
AND MINIMAL PERIODIC SOLUTIONS  
OF FIRST-ORDER VARIANT SUBQUADRATIC  
HAMILTONIAN SYSTEMS**

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ABSTRACT. Using the homological link theorem and iteration inequalities of Maslov-type index, we prove the multiplicity of subharmonic solutions for some variant subquadratic non-autonomous Hamiltonian systems. Moreover, the minimal period problem has also been considered for the variant subquadratic autonomous Hamiltonian systems.

**1. Introduction and main results**

In this paper, we first consider subharmonic solutions of the following non-autonomous Hamiltonian system

$$(1.1) \quad \begin{cases} -J\dot{z} = H'_z(t, z), \\ z(k\tau) = z(0), \quad k \in \mathbb{N}, \end{cases}$$

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