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Summary: Using the dual variational principle, this paper turns the problem of $P$-solution for first-order convex Hamiltonian systems into the dual variational problems, verifies that the dual functional satisfies the least action principle, so deduces the existence result of nontrivial $P$-solutions. Finally by comparing the critical values of the dual functional, the minimal period estimate is given for the $P$-solution.

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Hamiltonian system; $P$-solution; dual variational; minimal period