

On a Hamiltonian system with concave and convex nonlinearities

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Abstract

In this work we study a Hamiltonian elliptic system of equations with Dirichlet boundary condition and with non-linearities that are concave near the origin and are convex and superlinear at infinity. The concavity of the non-linearities depends on non-negative parameters λ and μ and we provide regions for the pairs (λ, μ) guaranteeing existence and non-existence of non-negative solutions. This work is inspired by the seminal work for the single equation done by Ambrosetti, Brezis and Cerami.