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Existence of nontrivial solutions of the semilinear cooperative elliptic systems involving subcritical Sobolev exponents. (Chinese. English summary) Zbl 1413.35177

Summary: The cooperative semilinear elliptic system involving subcritical Sobolev exponents was investigated. The existence of nontrivial solution to the system was obtained under different cases. In the case $0 < \lambda < \lambda_1$, through defining the functional and the corresponding Nehari manifold, we got that the functional $J(u, v)$ was bounded below. Then we proved that the functional had a minimizer, so the functional had a nontrivial critical point in the Nehari manifold and the problem had a nontrivial solution in $E$. In the case $\lambda_k < \lambda < \lambda_{k+1}$, the functional satisfied the conditions of local linking theorem. It is concluded that there exists at least one nontrivial solution.

MSC:
35J46 First-order elliptic systems
35J61 Semilinear elliptic equations

Keywords:
subcritical Sobolev exponents; cooperative elliptic systems; Nehari manifold; local linking theorem

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