

On a quasi-linear elliptic equation depending on the gradient

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Abstract

In this talk we show an existence theorem for a quasilinear elliptic problem with dependence on the gradient of the following type

$$\begin{cases} -\Delta_p u = f(x, u, \nabla u) & \text{in } \Omega \\ u = 0 & \text{on } \partial\Omega, \end{cases}$$

under general growth conditions. Our aim is to combine variational techniques with fixed point methods in order to prove the existence of a solution. More precisely our approach is based on sub-supersolution techniques, extremal solutions for an auxiliary parametric problem and Schaefer's fixed point theorem. A multiplicity theorem is also obtained. The existence of sign changing solutions will also be addressed.

Based on [1] and [2].

References

- [1] F. Faraci, D. Motreanu, D. Puglisi, Quasi-linear elliptic equations with dependence on the gradient, *Calc. Var. Partial Differential Equations* (2015) 525–538.
- [2] F. Faraci, D. Puglisi, Nodal solutions for semilinear elliptic equations with dependence on the gradient, work in progress.

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