Variational Problems with Pointwise Constraints on the Derivatives

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Abstract: This paper is concerned with the solvability of a class of nonlinear variational inequalities involving pointwise unilateral constraints on the laplacian. We describe the set of the pairs (ψ,h) of the right hand sides h and the obstacles ψ for which the problem has solutions and study the structure of the set of solutions. The existence and multiplicity results we obtain point out that the presence of the obstacle gives rise to some phenomena which are typical of the semilinear elliptic equations with "jumping" nonlinearities.

Keywords: Variational problems, Topological methods, Pointwise constraints on the laplacian, Nonsmooth analysis, Subgradients

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