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A quasi-linear Neumann problem of Ambrosetti-Prodi type in non-smooth domains

We investigate the solvability of the Ambrosetti-Prodi problem for the p -Laplace operator with Neumann boundary conditions. Using a priori estimates, regularity theory, a sub-supersolution method, and the Leray-Schauder degree theory, we obtain a necessary condition for the non-existence of solutions (in the weak sense), the existence of at least one solution, and the existence of at least two distinct solutions. Moreover, we establish global Hölder continuity for weak solutions of the Neumann problem of Ambrosetti-Prodi type on a large class of non-smooth domains.