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Elliptic equations involving the p-Laplacian and a gradient term

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SUMMARY

We investigate the problem

$$(P) \qquad \begin{cases} -\Delta_p u = g(u)|\nabla u|^p + f(x,u) & \text{in } \Omega, \\ u > 0 & \text{in } \Omega, \\ u = 0 & \text{on } \partial\Omega \end{cases}$$

in a bounded smooth domain $\Omega \subset \mathbb{R}^N$. Using a Kazdan-Kramer change of variable, we reduce this problem to a quasilinear one without gradient term and therefore approachable by variational methods. Among other results, we investigate the validity of the Ambrosetti-Rabinowitz condition. Existence and multiplicity results for (P) are established in several situations.

Joint work with D. de Figueiredo, H. Ramos Quoirin and P. Ubilla.

Keywords: Elliptic equations, Ambrosetti-Rabinowitz condition

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