

Weak Solutions of Quasilinear Elliptic Problems with Nonlinear Perturbations Involving Critical Exponents

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We will present some recent results on the existence of weak minimal and maximal solutions between an ordered pair of sub- and super-solutions for nonlinear perturbations of quasilinear elliptic equations (including the p -Laplacian). No monotonicity conditions are imposed on the nonlinear perturbations. Unlike previous results in this setting, we allow the growth of the nonlinear perturbations to go all the way to the critical Sobolev exponents in the appropriate Lebesgue spaces. The approach makes careful use of pseudomonotone operators, Zorn's lemma and a Kato's inequality with appropriate estimates.

In Special Session 28 on Recent Trends in Nonlinear Elliptic PDEs at the Mathematical Congress of the Americas 2025.