

Existence and nonexistence results for anisotropic quasilinear elliptic equations

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Abstract

We consider a new class of quasilinear elliptic equations with a power-like reaction term: the differential operator weights partial derivatives with different powers, so that the underlying functional-analytic framework involves anisotropic Sobolev spaces. Critical exponents for embeddings of these spaces into L^q have two distinct expressions according to whether the anisotropy is “concentrated” or “spread out”. Existence results in the subcritical case are affected by this dichotomy. On the other hand, nonexistence results are obtained in the at least critical case in domains with a geometric property which modifies the standard notion of starshapedness.