

Boccardo, L.; Murat, F.; Puel, J.-P.

Existence de solutions faibles pour des équations elliptiques quasi- linéaires à croissance quadratique. (Existence of weak solutions for quasilinear elliptic equations with quadratic growth). (French) [Zbl 0588.35041](#)

Nonlinear partial differential equations and their applications, Coll. France Semin., Vol. 4, Res. Notes Math. 84, 19-73 (1983).

[For the entire collection see [Zbl 0504.00010](#).]

The authors prove the existence of a weak solution for the elliptic problem

$$-\sum_{i,j=1}^n D_{x_i}(a_{ij}D_{x_j}u) + a_0u + f(x, u, Du) = 0 \quad \text{in } \Omega,$$

$u = 0$ in $\partial\Omega$, where $a_0(x) \geq c_0 > 0$ and f has a quadratic growth in Du . The proof is obtained by a regularization method and the convergence is proved using suitable exponential test functions.

MSC:

- [35J60](#) Nonlinear elliptic equations
- [35D05](#) Existence of generalized solutions of PDE (MSC2000)
- [35A25](#) Other special methods applied to PDEs

Cited in **1** Review
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Keywords:

[weak solution](#); [elliptic problem](#); [regularization method](#); [exponential test functions](#)