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Quasilinear elliptic equations with discontinuous coefficients. (English) Zbl 0679.35035

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Summary: We prove an existence result for equations of the form

$$-D_i(a_{ij}(x,u)D_ju) = f \quad in \quad \Omega, \quad u \in H_0^1(\Omega),$$

where the coefficients $a_{ij}(x,s)$ satisfy the usual ellipticity conditions and hypotheses weaker than the continuity with respect to the variable s. Moreover, we give a counterexample which shows that the problem above may have no solution if the coefficients $a_{ij}(x,s)$ are supposed only Borel functions.

MSC:

35J65	Nonlinear boundary value problems for linear elliptic equations
35B30	Dependence of solutions to PDEs on initial and/or boundary data and/or on parameters of PDEs
49J20	Existence theories for optimal control problems involving partial differential equations
35D05	Existence of generalized solutions of PDE (MSC2000)

Keywords:

quasilinear elliptic equations; Dirichlet problems; semicontinuity; calculus of variations