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**Existence of solutions to a superlinear  $p$ -Laplacian equation.** (English) Zbl 1011.35062  
*Electron. J. Differ. Equ.* 2001, Paper No. 66, 6 p. (2001).

Existence of nontrivial solutions for the Dirichlet problem  $-\Delta_p u = f(x, u)$  in  $\Omega$ ,  $u = 0$  on  $\partial\Omega$  is studied. Here,  $-\Delta_p u$  is the  $p$ -Laplacian,  $p > 1$ , and  $f$  is a Caratheodory function, which has “superlinear” and subcritical growth for large  $|u|$ . For small  $|u|$ ,  $f$  is assumed to behave like  $\lambda|u|^{p-2}u$ , where  $\lambda$  is between the first and the second Dirichlet eigenvalue of the  $p$ -Laplacian. The corresponding variational functional is studied by means of Morse theory.

Reviewer: [Hans-Christoph Grunau \(Bayreuth\)](#)

**MSC:**

[35J65](#) Nonlinear boundary value problems for linear elliptic equations  
[35B34](#) Resonance in context of PDEs  
[35A07](#) Local existence and uniqueness theorems (PDE) (MSC2000)  
[49J35](#) Existence of solutions for minimax problems

Cited in **27** Documents

**Keywords:**

Morse theory; subcritical growth; first eigenvalue; second eigenvalue; Dirichlet problem; corresponding variational functional

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