

**REGULARITY OF MINIMIZING SEQUENCES FOR  
FUNCTIONALS OF THE CALCULUS OF VARIATIONS  
VIA THE EKELAND PRINCIPLE**

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**1. Introduction.** In this paper we are going to consider some properties of the minimizing sequences for functionals of the type

$$J(u) = \int_{\Omega} f(x, u, \nabla u) dx, \quad (1)$$

with  $f$  a Carathéodory function satisfying the classical (see [9]) hypotheses that guarantee the existence of a minimum for  $J$  on the Sobolev space  $W_0^{1,p}(\Omega)$ , and  $\Omega$  is an open, bounded subset of  $\mathbf{R}^N$ ,  $N \geq 2$ . Various regularity results are known for the minima of  $J$ , depending on the regularity of the integrand  $f$  with respect to  $x$ ,  $u$  and  $\nabla u$ . We are going to show that if a minimum  $u$  of  $J$  has a certain regularity (say,  $u$  belongs to  $L^\infty(\Omega)$ , or to

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