© 2005 Heldermann Verlag
Journal of Convex Analysis 12 (2005) 267–278

F. Leonetti
Dip. di Matematica, Università d'Aquila, 67100 L'Aquila, Italy
leonetti@univaq.it

F. Siepe
Dip. di Matematica, Università di Firenze, Piazza Ghiberti 27, 50122 Firenze, Italy
siepe@math.unifi.it

Maximum Principle for Vector Valued Minimizers

We prove a maximum principle for vector valued minimizers $u : \Omega \subset \mathbb{R}^n \to \mathbb{R}^N$ of some functionals

$$\mathcal{F}(u) = \int_\Omega f(x, Du(x))dx.$$

The main assumption on the density $f(x,z)$ is a kind of "monotonicity" with respect to the $N \times n$ matrix z. A model density is $f(z) = |z|^4 - (\det z)^2$, where $z \in \mathbb{R}^{2\times 2}$. We also consider relaxed functionals

$$\mathcal{RF}(u) = \inf\{\liminf_k \mathcal{F}(u_k) : \quad u_k \to u\}$$

and we prove maximum principle under suitable assumptions.

Keywords: Calculus of variations, minimizers, rank-one convexity, maximum principle, relaxation.

MSC: 49N60; 35J60