Corrections to the Paper

Variational Problems with Non-Convex Obstacles and an Integral-Constraint for Vector-Valued Functions

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Since in our paper [1] the proof of the last theorem contains some misprints, we here repeat the proof of this

Theorem. Let $\Omega \subset \mathbb{R}^n$, $n \geq 3$, and $M \subset \mathbb{R}^N$, $N \geq 2$, denote bounded open sets and assume that ∂M is of class C^2 and that there exists a bi-Lipschitz map $P: \bar{M} \rightarrow K := \{z \in \mathbb{R}^N: |z| \leq 1\}$. Suppose further that $u \in H^1(\Omega, \bar{M}) := \{v \in H^1(\Omega)^N: v(x) \in \bar{M}\}$ is a local minimizer of Dirichlet's integral in this class. Then there exists an open set $\Omega_0 \subset \Omega$ such that $u \in C^{1,\alpha}(\Omega_0)$ for all $0 < \alpha < 1$. For $n = 3$ $\Omega \sim \Omega_0$ is discrete, in general we have $\text{IH-dim}(\Omega \sim \Omega_0) \leq n - 3$.

Here IH-dim denotes the Hausdorff-dimension of the set. For the proof one only has to observe that all arguments from [2] can be carried over without changes, the boundedness of u required in [2] is implied by the side-condition and all comparison-maps used by Giaquinta-Giusti respect the obstacle. The only minor modification occurs in the proof of [2], Lemma 1, where it is shown that certain blow-ups converge to a minimizer. The map $v^v := w + \eta(u^v - v)$ introduced there has to be replaced by $v^v := (P^{-1} \circ Q)(Pw + \eta(Pu^v - Pv))$ where $Q: \{z \in \mathbb{R}^N: |z| \leq 3\} \rightarrow K$ denotes the standard retraction.

References

1. Duzaar, F., Fuchs, M.: Variational problems with non-convex obstacles and an integral-constraint for vector-valued functions. Math. Z. **191**, 585–591 (1986)
2. Giaquinta, M., Giusti, E.: The singular set of the minima of certain quadratic functionals. Preprint no. 453 SFB 72

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