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Hausdorff measure estimates of a free boundary for a minimum problem. (English)

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Commun. Partial Differ. Equations 8, 1409-1454 (1983).

If $G \subset R^n$ is a bounded set with ∂G a Lipschitz graph, $B_r(x)$ the closed ball with radius r and center x, then for a non-negative function u defined on G, let $\Lambda(u) = \{x \in G : u = 0\}$, $\Omega(u) = \{x \in G : u > 0\}$, $F(u) = \partial\Omega(u) \cap \partial\Lambda(u)$. The author gives a number of Hausdorff measure estimates for $F(u) \cap B_r$ where $B_{4r} \in G$ and the function u is a minimum for the functional $J(\nu) = \int_G (1/2|\nabla\nu|^2 + |\nu|^\gamma)dx$ in the convex set $K = \{\nu \in H^1(G) : \nu - u_0 \in H_0^1(G)\}$, for a fixed $u_0 \in H_0^1$, $u_0 \geq 0$, $0 < \gamma < 2$.

Reviewer: W.Rundell

MSC:

35R35	Free boundary problems for PDEs
35J85	Unilateral problems; variational inequalities (elliptic type) (MSC2000)
49J20	Existence theories for optimal control problems involving partial differential equations

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