

Schoen, Richard; Uhlenbeck, Karen

Boundary regularity and the Dirichlet problem for harmonic maps. (English) Zbl 0547.58020
J. Differ. Geom. 18, 253-268 (1983).

Closely related to their fundamental paper in *ibid.* 17, 307-335, Correction *ibid.* 19, 329 (1982; [Zbl 0521.58021](#)) the authors prove here boundary regularity for energy minimizing maps with prescribed Dirichlet boundary condition, more precisely, they show that, for compact M with $C^{2,\alpha}$ boundary, an \tilde{E} -minimizing $u \in L_1^2(M, N)$ whose image lies a.e. in a compact subset N_0 of the range N is of class $C^{2,\alpha}$ in a full neighbourhood of ∂M provided that $u/\partial M \in C^{2,\alpha}(\partial M, N_0)$ (in fact, the singular set of u is compact and lies in the interior of M). By the direct method, they also recover an earlier result of *J. Sacks* and the second author [*Ann. Math.*, II. Ser. 113, 1-24 (1981; [Zbl 0462.58014](#))] and show harmonic representability of elements of $\pi_k(N)$ for certain N . Finally, they settle the approximation problems posed by *J. Eells* and *L. Lemaire* [*Reg. Conf. Ser. Math.* 50 (1983; [Zbl 0515.58011](#))] by showing that L_1^2 -maps from 2-manifolds can be approximated by smooth maps and giving an example of an L_1^2 -map from the 3-ball to the 2-sphere which is not an L_1^2 -limit of continuous maps.

Reviewer: [G.Toth](#)

MSC:

[58E20](#) Harmonic maps, etc.

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Keywords:

[harmonic map](#); [Dirichlet problem](#); [regularity](#)

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