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Relaxed energies, defect measures, and minimal currents. (English) [Zbl 07571289]

A natural existence question for a continuous harmonic map with a suitably given Dirichlet boundary value or in a given homotopic class (a problem posed by R. Schoen) remains open. The author briefly describes several earlier studies concerning energy minimizing harmonic maps, and maps that minimize the so-called relaxed energy from $\mathbb{R}^3$ into $S^2$. Of particular interest is the partial regularity and properties of possible singularities of such maps. A sketch proof of a formula conjectured by H. Brezis and P. Mironescu [Sobolev maps to the circle. From the perspective of analysis, geometry, and topology. New York, NY: Birkhäuser (2021; Zbl 07332819)] is provided, concerning the relaxed $k$-energy for Sobolev maps from $\mathbb{R}^n$ to $S^k$, for $k > 1$.

For the entire collection see [Zbl 1491.46003].

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MSC:
58E20 Harmonic maps, etc.
46E35 Sobolev spaces and other spaces of “smooth” functions, embedding theorems, trace theorems

Keywords:
relaxed energy; minimizing map; defect measure; area-minimizing current; singularities

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