ENERGY-MINIMAL DIFFEOMORPHISMS BETWEEN DOUBLY CONNECTED RIEMANN SURFACES

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ABSTRACT. Let $N = (\Omega, \sigma)$ and $M = (\Omega^*, \rho)$ be doubly connected Riemann surfaces and assume that ρ is a smooth metric with bounded Gauss curvature $\mathcal{K}$ and finite area. The paper establishes the existence of homeomorphisms between Ω and Ω^* that minimize the Dirichlet energy. *Among all homeomorphisms* $f\colon \Omega \xrightarrow{\text{onto}} \Omega^*$ *between doubly connected domains such that* $\operatorname{Mod}\Omega \leqslant \operatorname{Mod}\Omega^*$ *there exists, unique up to conformal authomorphisms of* Ω*, an energy-minimal diffeomorphism which is a harmonic diffeomorphism. The results improve and extend some recent results of Iwaniec, Koh, Kovalev and Onninen (Inven. Math. (2011)) and can be considered as a variation of results of Iwaniec, Kovalev, Onninen (Proc. Roy. Soc. Edinburgh Sect. A (2011))* where the authors considered doubly connected domains in the complex plane w.r. to Euclidean metric.

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