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Tadeusz Iwaniec and **Leonid V. Kovalev*** (lvkova1e@syr.edu), Department of Mathematics, 215 Carnegie Building, Syracuse University, Syracuse, NY 13244, and **Jani Onninen**. *If Grötzsch had met Nitsche: Doubly connected minimal surfaces and extremal harmonic mappings.*

The concept of a conformal deformation has two natural extensions: quasiconformal and harmonic mappings. Both classes do not preserve the conformal type of the domain, however they cannot change it in an arbitrary way. Doubly connected domains are where one first observes nontrivial conformal invariants. Herbert Grötzsch and Johannes C. C. Nitsche addressed this issue for quasiconformal and harmonic mappings, respectively. Combining these concepts we obtain sharp estimates for quasiconformal harmonic mappings between doubly connected domains. We then apply our results to the Cauchy problem for minimal surfaces. Specifically, we obtain a sharp estimate of the modulus of a doubly connected minimal surface that evolves from its inner boundary with a given initial slope. (Received December 23, 2009)