

An invitation to n -harmonic hyperelasticity

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Abstract

We give an account of a few of recent developments in which the quasiconformal theory and nonlinear elasticity share common problems of compelling mathematical interest. We study deformations between bounded domains in Euclidean n -space. The general law of hyperelasticity requires that there exists an energy integral so that the elastic deformations have smallest energy. We introduce natural conditions on the integrand that guarantee the existence and global invertibility of the minimizers. The key tools in finding an extremal deformation are the free Lagrangians. We demonstrate these ideas in the case of the total harmonic energy and a pair of annuli.

The talk is based on joint work with Tadeusz Iwaniec.