

Existence of the 1-harmonic map flow

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Abstract

Similarly as in the real-valued case, the total variation of maps taking values in a Riemannian manifold \mathcal{N} , defined by

$$\int_{\Omega} |\nabla u|$$

for $u \in C^1(\Omega, \mathcal{N})$, extends to a lower semicontinuous functional $L^2(\Omega, \mathcal{N}) \rightarrow [0, +\infty]$. However, in general this functional is not geodesically semiconvex, so the existence of its gradient flow is not provided by general variational theory. Alternatively, one can try to apply the theory of parabolic PDE systems, mimicking the approach used for p -harmonic map flows, $p > 1$. This poses some difficulties, because the PDE system corresponding to the flow is strongly nonlinear, singular and degenerate. However, in some cases, this approach was successful. In this talk, I will report on recent results on the existence of the flow obtained in cooperation with L. Giacomelli and S. Moll.