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A DeGiorgi type conjecture for divergence-free maps

We focus on N-dimensional maps u of vanishing divergence defined on the cylinder $\mathbb{R} \times \mathbb{T}^{N-1}$. They minimize a Modica-Mortola type functional with a nonnegative potential W under a boundary condition at infinity that forces u to make a transition between two zeros of W. We characterize the class of potentials W such that every global minimizer u is one-dimensional. Our method is based on calibrations adapted to divergence-free maps. It is a joint work with Antonin Monteil (Louvain-la-Neuve).