

Abstract

Let Σ be a smooth Riemannian manifold, $\Gamma \subset \Sigma$ a smooth closed oriented submanifold of codimension higher than 2 and T an integral area-minimizing current in Σ which bounds Γ . We prove that the set of regular points of T at the boundary is dense in Γ . Prior to our theorem the existence of any regular point was not known, except for some special choice of Σ and Γ . As a corollary of our theorem

- we answer to a question in Almgren's *Almgren's big regularity paper* from 2000 showing that, if Γ is connected, then T has at least one point p of multiplicity $\frac{1}{2}$, namely there is a neighborhood of the point p where T is a classical submanifold with boundary Γ ;
- we generalize Almgren's connectivity theorem showing that the support of T is always connected if Γ is connected;
- we conclude a structural result on T when Γ consists of more than one connected component, generalizing a previous theorem proved by Hardt and Simon in 1979 when $\Sigma = \mathbb{R}^{m+1}$ and T is m -dimensional.