

INSALATE DI MATEMATICA

presents

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*Area functional and relaxation:
an approach via strict convergence in BV*



Abstract:

Relaxation of the Cartesian area functional allows to extend in a natural way the area of a graph to non smooth maps, and has been very successful for scalar valued functions. Mainly for coercivity reasons, it is reasonable to relax the area using the L^1 -topology. However, when the codimension of the graph is larger than 1, an integral representation of the L^1 -relaxed functional is not possible since, as suggested by De Giorgi and proven by Acerbi and Dal Maso, the subadditivity property is very frequently lost. In our work, we propose to relax the area with respect to the strict convergence in BV : this simplifies the analysis, since it seems to kill most of the nonlocality phenomena, but still requires a nontrivial analysis. We focus on maps from the plane to the plane and give an explicit integral representation of the BV -relaxed area for Sobolev maps valued S^1 and for a special class of piecewise Lipschitz maps, jumping on a union of curves meeting at multiple junction points. These results were obtained in collaboration with G. Bellettini (Siena and ICTP) and R. Scala (Siena).

Keywords: area functional · relaxation · integral currents · plateau problem

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*"Obvious" is the most dangerous word in mathematics.
(Eric Temple Bell)*