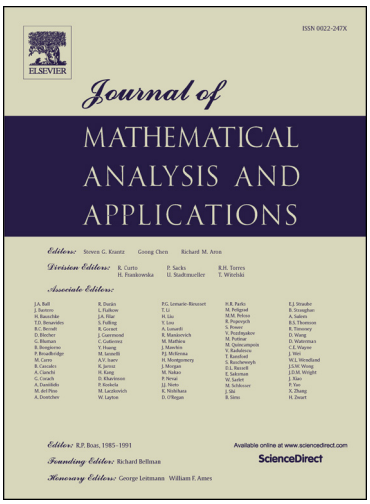
Accepted Manuscript



Some existence results of bounded variation solutions to 1-biharmonic problems

Sara Barile, Marcos T.O. Pimenta

PII: S0022-247X(18)30246-4
DOI: https://doi.org/10.1016/j.jmaa.2018.03.040
Reference: YJMAA 22116

To appear in: *Journal of Mathematical Analysis and Applications*

Received date: 3 August 2017

Some existence results of bounded variation solutions to 1-biharmonic problems

Sara Barile[1] and Marcos T. O. Pimenta[2]

1. Dipartimento di Matematica

Università degli Studi di Bari Aldo Moro

Via E. Orabona 4, 70125 Bari, Italy

2. Departamento de Matemática e Computação

Fac. de Ciências e Tecnologia, Universidade Estadual Paulista - UNESP

19060-900 - Presidente Prudente - SP, Brazil

e-mail addresses: sara.barile@uniba.it, pimenta@fct.unesp.br (corresponding author)

Abstract

In this paper we establish some existence results to a fourth-order quasilinear elliptic equation involving the 1−biharmonic operator, formally given by $\Delta_1^2 u = \Delta\left(\frac{\Delta u}{|\Delta u|}\right)$. We consider different geometrical assumptions in the nonlinearity and use variational methods in order to get nontrivial ground-state solutions.

Keywords. 1-biharmonic operator, bounded variation functions, variational methods.

2010 Mathematics Subject Classification. 35J30, 35J62.

1 Introduction and main results

In this work we are interested in the following quasilinear fourth-order problem

$$\begin{cases} \Delta_1^2 u = f(x,u) & \text{in } \Omega, \\ u = \dfrac{\Delta u}{|\Delta u|} = 0 & \text{on } \partial\Omega, \end{cases} \tag{1.1}$$