

$p(x)$ -Harmonic functions with unbounded exponent in a subdomain

José Miguel Urbano

CMUC - University of Coimbra, Portugal
(jmurb@mat.uc.pt)

Abstract

We study the Dirichlet problem for the $p(x)$ -Laplacian, in the case when the variable exponent $p(x)$ is infinite in a subdomain D of U . The main issue is to give a proper sense to what a solution is. To this end, we consider the limit of the solutions u_n to the corresponding problem when $p_n(x) = \min(p(x), n)$, in particular, with p_n in D . Under suitable assumptions on the data, we find that such a limit exists and that it can be characterized as the unique solution of a variational minimization problem which is, in addition, infinity-harmonic within D . Moreover, we examine this limit in the viscosity sense and find the boundary value problem it satisfies in the whole of U .

This is a joint work with Juan J. Manfredi and Julio D. Rossi.