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Multivalued Homogeneous Neumann Problem Involving Diffuse Measure Data and Variable Exponent

S. Ouaro [1*] A. Ouedraogo [2] and S. Soma [1]

[1] *Université de Ouagadougou, Laboratoire de Mathmatiques et Informatique (LAMI), Unité de Formation et de Recherches en Sciences Exactes et Appliquées, Département de Mathématiques, 03 BP 7021 Ouaga 03 Ouagadougou, Burkina Faso.*

[2] *Université de Koudougou, Laboratoire de Mathmatiques et Informatique (LAMI), Unité de Formation et de Recherches en Sciences Exactes et Appliquées, Département de Mathématiques, BP 376 Koudougou, Burkina Faso.*

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Abstract: We study a nonlinear elliptic problem with homogeneous Neumann boundary condition, governed by a general Leray-Lions operator with variable exponents and Radon measure data which does not charge the sets of zero $p(.)$-capacity. We prove an existence and uniqueness result of weak solution.

Keywords: *Neumann boundary condition; diffuse measure; biting lemma of Chacon; maximal monotone graph; Radon measure data; weak solution; entropic solution; Leray-Lions operator.*

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1 Introduction and Main Results

Our aim is to study the existence and uniqueness of a solution for nonlinear homogeneous Neumann boundary value problem of the form

$$N(\beta,\mu)\begin{cases} -\nabla\cdot a(x,\nabla u)+\beta(u)\ni\mu & \text{in } \Omega,\\ a(x,\nabla u).\eta=0 & \text{on } \partial\Omega,\end{cases}$$

where η is the unit outward normal vector on $\partial\Omega$, β is a maximal monotone graph on $\mathbb{R}$ such that $0\in\beta(0)$, a is a Leray-Lions operator, μ is a diffuse measure such that $\mu=\mu\lfloor\Omega$

* Corresponding author: mailto:ouaro@yahoo.fr