

**Existence and uniqueness of weak and entropy solutions for homogeneous
Neumann boundary value problem involving variable exponent**

by

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Abstract: In this work we study the following nonlinear homogeneous Neumann boundary value problem $b(u) - \operatorname{div} a(x, \nabla u) = f$ in Ω , $a(x, \nabla u) \cdot \eta = 0$ on $\partial\Omega$ where Ω is a smooth bounded open domain in $\mathbb{R}^N$, $N \geq 3$. We prove the existence and uniqueness of a weak solution for $f \in L^\infty(\Omega)$ and the existence and uniqueness of an entropy solution for L^1 -data f . The functional setting involves Lebesgue and Sobolev spaces with variable exponent.