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Asymptotic Behaviour of Some Equations in Orlicz Spaces

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Abstract: In this paper, we prove an existence and uniqueness result for solutions of some bilateral problems of the form

$$\begin{cases} \langle Au, v-u\rangle \geq \langle f, v-u\rangle, \ \forall v \in K \\ u \in K \end{cases}$$

where A is a standard Leray-Lions operator defined on $W_0^1 L_M(\Omega)$, with M an N-function which satisfies the Δ_2-condition, and where K is a convex subset of $W_0^1 L_M(\Omega)$ with obstacles depending on some Carathéodory function $g(x,u)$. We consider first, the case $f \in W^{-1}E_{\overline{M}}(\Omega)$ and secondly where $f \in L^1(\Omega)$. Our method deals with the study of the limit of the sequence of solutions u_n of some approximate problem with nonlinearity term of the form $|g(x,u_n)|^{n-1}g(x,u_n) \times M(|\nabla u_n|)$.

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