VARIATIONAL PROBLEMS WITH POINTWISE CONSTRAINTS AND DEGENERATION IN VARIABLE DOMAINS

ALEXANDER A. KOVALEVSKY AND OLGA A. RUDAKOVA

Abstract. In this article we deal with a sequence of functionals defined on weighted Sobolev spaces. The spaces are associated with a sequence of domains $\Omega_s$ contained in a bounded domain $\Omega$ of $\mathbb{R}^n$. The main structural components of the functionals are integral functionals whose integrands satisfy a growth and coercivity condition with a weight and additional terms $\psi_s \in L^1(\Omega_s)$. For the given functionals we consider variational problems with sets of constraints for functions $v$ of the kind $h(x,v(x)) \leq 0$ a.e. in $\Omega_s$, where $h : \Omega \times \mathbb{R} \rightarrow \mathbb{R}$. We establish conditions on $h$ and $\psi_s$ and on the given domains, weighted spaces and functionals under which solutions of the variational problems under consideration converge in a certain sense to a solution of a limit variational problem with the set of constraints defined by the same function $h$.


Keywords and phrases: variational problem, integral functional, degenerate integrand, pointwise constraint, variable domains, convergence of minimizers, $\Gamma$-convergence.

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