

DOUBLY NONLINEAR EVOLUTION INCLUSIONS OF
TIME-DEPENDENT SUBDIFFERENTIALS
–QUASI-VARIATIONAL APPROACH–

Dedicated to the memory of Professor Isamu Fukuda

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Abstract. This paper is concerned with doubly nonlinear evolution inclusions governed by time-dependent subdifferentials with the unknown-dependent constraints of the form:

$$\partial_* \psi^t(u; u'(t)) + \partial_* \varphi^t(u; u(t)) + g(u; t, u(t)) \ni f(t) \text{ in } V^*, \quad u(0) = u_0 \text{ in } V,$$

where V is a uniformly convex Banach space with its dual space V^* ; $\partial_* \psi^t(v; z)$ and $\partial_* \varphi^t(v; z)$ are subdifferentials from V into V^* of convex functions $z \rightarrow \psi^t(v; z)$ and $z \rightarrow \varphi^t(v; z)$ on V , v being an unknown parameter; $g(v; t, z)$ is a perturbation term depending on the parameter v . The main objective of this paper is to establish an existence result of the above problem which includes the so-called quasi-variational structure, specifying the classes of functions $\psi^t(v; z)$ and $\varphi^t(v; z)$.

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