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Ordered Non-Convex Quasi-Variational Sweeping Processes

This paper addresses the Cauchy problem for the quasi-variational sweeping process in the ordered Hilbert space H

$$-u'(t) \in N_{C(t,u(t))}(u(t)) \quad \text{for a.e. } t \in (0, T), \quad u(0) = u_0,$$

where the set $C(t, u(t)) \subset H$ is non-convex and $N_{C(t,u(t))}$ denotes its normal cone. We provide an existence result based on the classical implicit time-discretization procedure and on a fixed point argument in ordered spaces.

Keywords: Sweeping process, non-convex sets, orders in Hilbert spaces.

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