

Methods of non-linear analysis and topological methods of variation inequalities and evolution inclusions

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Variation inequalities and evolution inclusions in Banach spaces with w_{λ_0} -pseudo-monotone maps are investigated. The Faedo–Galerkin method and the method of finite differences for the resolvability for the given objects under the weakened $+$ -coercive condition, w_{λ_0} -pseudo-monotony, quasi-boundedness and condition S_k are based. The important a priori estimated are obtained. It is proved, that the class of maps with semi-bounded variation swallows the class of semi-monotone multi-valued maps. The class of multi-valued maps, under consideration, forms a convex cone in a class $\mathbf{B}(X; X^*)$.

The base properties of sub-differential maps and variation inequality in Freshet spaces are investigated. For a definite class of non-reflexive spaces of distributions with integrable derivatives a series of theorems about a continuity and compactness embedding are proved.