EVOLUTIONARY QUASI-VARIATIONAL AND VARIATIONAL INEQUALITIES WITH CONSTRAINTS ON THE DERIVATIVES

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In this talk I shall present a general framework for the study of the existence of quasi-variational and variational solutions to a class of nonlinear evolution systems in convex sets of Banach spaces describing constraints on a linear combination of partial derivatives of the solutions, which is a joint work with Lisa Santos and Fernando Miranda. The quasi-linear operators are of monotone type, but are not required to be coercive for the existence of weak solutions, which is obtained by a double penalisation/regularisation for the approximation of the solutions. In the case of time-dependent convex sets that are independent of the solution, we show also the uniqueness and the continuous dependence of the strong solutions of the variational inequalities, extending previous results to a more general framework and including several models that will be surveyed.