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On the semilinear multi-valued flow under constraints and the periodic problem

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Abstract: In the paper we will be concerned with the topological structure of the set of solutions of the initial value problem of a semilinear multi-valued system on a closed and convex set. Assuming that the linear part of the system generates a C_0 -semigroup we show the R_δ -structure of this set under certain natural boundary conditions. Using this result we obtain several criteria for the existence of periodic solutions for the semilinear system. As an application the problem of controlled heat transfer in an isotropic rigid body is considered.

Keywords: multi-valued maps, C_0 -semigroup, initial value problem under constraints, R_δ -sets, periodic solutions, equilibria, control problem

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