

# Stability, approximation and relaxation of differential inclusions and the one-sided Lipschitz condition

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## Abstract

The one-sided Lipschitz (OSL) condition introduced less than twenty years ago for set-valued maps, extends the classical Lipschitz condition and also generalizes known monotonicity-type conditions for single-valued and set-valued functions. It replaces successfully the Lipschitz condition in some important approximation results and has a growing number of applications. For instance, as in the Lipschitz case, the OSL condition yields Lipschitz approximation of the trajectory and reachable set of a differential inclusion with respect to perturbations in the initial state.

Its original form, however, does not provide neither the approximation of the velocity set, nor the relaxation stability in optimization problems, and has to be modified for such purposes.

In this talk we will present some results on stability, approximations and relaxation of differential inclusions and related control problems, involving variants of this condition, proved in the last decade.

**Key Words:** One-sided Lipschitz, differential inclusions, stability, approximation, solution set, relaxation