Topological entropy of impulsive differential inclusions

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We will consider differential inclusions with nonautonomous multivalued impulses on tori. By a *topological entropy* of such systems, we mean the one of the compositions of the associated Poincaré translation operators along the trajectories with admissible (in the sense of Lech Górniewicz) impulsive maps. Although topological entropy is not a homotopy invariant, effective sufficient conditions of a positive entropy can be given just in terms of the Lefschetz numbers of given impulsive maps. This is possible due to the application of the generalized Ivanov-type inequality which allows us to estimate the entropy values from below by means of the asymptotic Nielsen numbers, jointly with the Anosov-type equality.

Our result generalizes and improves earlier theorems in this field, presented in the papers [1, 2, 3].

References

[1] J. Andres: Parametric topological entropy and differential equations with time-dependent impulses. J. Diff. Eqns 317 (2022), 365-386.

[2] J. Andres: Parametric topological entropy and differential equations with time-dependent impulses II: multivalued case. J. Diff. Eqns 367 (2023) 783-803.

[3] J. Andres, P. Ludvík: Parametric topological entropy for multivalued maps and differential inclusions with nonautonomous impulses. Int. J. Bifurc. Chaos 39, 9 (2023), 2350113, 1-13.