Dynamical systems with strongly convergent trajectories associated to monotone inclusions with composite structure

Sorin-Mihai Grad[*]

08.10.2020

Abstract

Zeros of the sum of a maximally monotone operator with a single-valued monotone one can be obtained as weak limits of trajectories of dynamical systems, for strong convergence demanding hypotheses being imposed. We extend an approach due to Attouch and Cominetti with several coauthors (see [1, 2]), where zeros of maximally monotone operators are obtained as strong limits of trajectories of Tikhonov regularized dynamical systems, to forward-backward and forward-backward-forward dynamical systems whose trajectories strongly converge towards towards zeros of such sums of monotone operators under reasonable assumptions. We also discuss how ODE solvers can be employed in convex optimization by presenting applications in split feasibility problems and variational inequalities.

This talk is based on joint work [3] with Radu Ioan Boţ, Dennis Meier and Mathias Staudigl.

References

[1] H. Attouch, R. Cominetti: *A dynamical approach to convex minimization coupling approximation with the steepest descent method*, Journal of Differential Equations 128:519–540, 1996

[2] R. Cominetti, J. Peypouquet, S. Sorin: *Strong asymptotic convergence of evolution equations governed by maximal monotone operators with Tikhonov regularization*, Journal of Differential Equations 245:3753–3763, 2008

[3] R.I. Boţ, S.-M. Grad, D. Meier, M. Staudigl: *Inducing strong convergence of trajectories in dynamical systems associated to monotone inclusions with composite structure*, Advances in Nonlinear Analysis 10:450–476, 2021