The minimal control time for the exact controllability by internal controls of 1D linear hyperbolic systems

Guillaume Olive*

Abstract

In this talk we will present the minimal control time for the exact controllability by internal controls of one-dimensional (1D) linear hyperbolic systems when the number of controls is equal to the number of state variables. The controls are supported in space in an arbitrary open subset. This presentation will be based on the work [HO24] in collaboration with Long Hu (Shandong University), with preliminary material taken from [HO21, HO22], by the same authors. An important ingredient is a technique introduced by Manuel González-Burgos and his collaborators in the survey [AKBGBdT11].

References

[AKBGBdT11] Farid Ammar-Khodja, Assia Benabdallah, Manuel González-Burgos, and Luz de Teresa, *Recent results on the controllability of linear coupled parabolic problems: a survey*, Math. Control Relat. Fields **1** (2011), no. 3, 267–306.

[HO21] Long Hu and Guillaume Olive, *Minimal time for the exact controllability of one-dimensional first-order linear hyperbolic systems by one-sided boundary controls*, J. Math. Pures Appl. (9) **148** (2021), 24–74.

[HO22] ———, *Equivalent one-dimensional first-order linear hyperbolic systems and range of the minimal null control time with respect to the internal coupling matrix*, J. Differential Equations **336** (2022), 654–707.

[HO24] ———, *The minimal control time for the exact controllability by internal controls of 1D linear hyperbolic balance laws*, ESAIM Control Optim. Calc. Var. **30** (2024), Paper No. 82, 13.

*Faculty of Mathematics and Computer Science, Jagiellonian University, ul. Łojasiewicza 6, 30-348 Kraków, Poland. E-mail: math.golive@gmail.com