Available online at www.sciencedirect.com

ScienceDirect

J. Differential Equations 257 (2014) 638–719

Journal of Differential Equations

www.elsevier.com/locate/jde

# On the controllability of the non-isentropic 1-D Euler equation

Olivier Glass

*CEREMADE, UMR 7534, Université Paris-Dauphine & CNRS, Place du Maréchal de Lattre de Tassigny, 75775 Paris Cedex 16, France*

Received 6 June 2013

Available online 5 May 2014

**Abstract**

In this paper, we examine the question of the boundary controllability of the one-dimensional non-isentropic Euler equation for compressible polytropic gas, in the context of weak entropy solutions. We consider the system in Eulerian coordinates and the one in Lagrangian coordinates. We obtain for both systems a result of controllability toward constant states (with the limitation $\gamma < \frac{5}{3}$ on the adiabatic constant for the Lagrangian system). The solutions that we obtain remain of small total variation in space if the initial condition is itself of sufficiently small total variation.


*Keywords:* Boundary control; Controllability; Hyperbolic systems of conservation laws; Entropy solutions; Compressible fluids

**Contents**



*E-mail address:* glass@ceremade.dauphine.fr.

http://dx.doi.org/10.1016/j.jde.2014.04.013
0022-0396/