A controllability result for the the non-isentropic 1-D Euler equation

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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. For both systems a result of controllability toward constant states is obtained (with a limitation on the adiabatic constant for the Lagrangian system). Moreover the solutions that are constructed remain of small total variation in space for all time.