Finite-time stabilization of a system of conservation laws.

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We investigate the finite-time boundary stabilization of a one-dimensional first order quasilinear hyperbolic system of diagonal form on [0,1].
The dynamics of the boundary controls are governed by a finite-time stable ODE. The solutions of the closed-loop system issuing from small initial data in Lip ([0,1]) are shown to exist for all times and to reach the null equilibrium state in finite time. The above feedback strategy is applied to the Saint-Venant system for the regulation of water flows in a network of canals. The efficiency of the feedback law is confirmed by some numerical simulations.