Ancona, Fabio; **Marson, Andrea**

On the attainable set for scalar nonlinear conservation laws with boundary control. (English)

Zbl 0919.35082
SIAM J. Control Optimization 36, No. 1, 290-312 (1998).

The authors consider the initial value problem with boundary control for a scalar nonlinear conservation law $u_t + f(u)_x = 0$, $u(0,x) = 0$, $u(.,0) = v \in U$ for $x > 0$, $t > 0$, where U is a set of bounded boundary data regarded as controls, and f is assumed to be strictly convex. They give a characterization of the set of attainable profiles at fixed time T $\{u(T,.);\ u$ is a solution$\}$ and at a fixed point x $\{u(.,x);\ u$ is a solution$\}$. Moreover, they prove that these sets are compact subsets of L_1 and $L_{1,\mathrm{loc}}$ respectively, whenever U is a set of controls which pointwise satisfy closed convex constraints, together with some additional integral inequalities. Finally, they apply obtained results to the model of traffic flow.

Reviewer: A.Doktor (Praha)

MSC:

35L65 Hyperbolic conservation laws
35B37 PDE in connection with control problems (MSC2000)

Keywords:

set of attainable profiles; closed convex constraints; model of traffic flow

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