On approach by semigroups for a scalar conservation law

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Abstract
In this section we considered an approach by semigroups for a scalar conservation law.

\[ \begin{align*}
  u_t + f(u)_x &= 0, \\
  u(x, 0) &= u_0(x)
\end{align*} \tag{1} \]

An original proof of Kružkov’s theorem, due to Crandall [1], is based on the particular properties of the scalar case, notably the fact that the solution of the Cauchy problem furnishes a semi-group of contractions in \( L^1 \cap L^\infty (\mathbb{R}) \). In the one-dimensional case, which is ours, we can again take advantage of the order structure on \( \mathbb{R} \) to have the shortest of the proofs of existence of an entropy solution of (1).

References

