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Well-posedness in BV_t and convergence of a difference scheme for continuous sedimentation in ideal clarifier-thickener units. (English) [Zbl 1053.76047](#)

Numer. Math. 97, No. 1, 25-65 (2004).

Summary: We consider a scalar conservation law modeling the settling of particles in an ideal clarifier-thickener unit. The conservation law has a nonconvex flux which is spatially dependent on two discontinuous parameters. We suggest to use a Kruzhkov-type notion of entropy solution for this conservation law and prove uniqueness (L^1 stability) of the entropy solution in the BV_t class (functions $W(x, t)$ with $\partial_t W$ being a finite measure). The existence of a BV_t entropy solution is established by proving convergence of a simple upwind finite difference scheme (of Engquist-Osher type). A few numerical examples are also presented.

MSC:

- [76M20](#) Finite difference methods applied to problems in fluid mechanics
- [76T20](#) Suspensions
- [65M12](#) Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs
- [65M06](#) Finite difference methods for initial value and initial-boundary value problems involving PDEs
- [35L65](#) Hyperbolic conservation laws
- [35R05](#) PDEs with low regular coefficients and/or low regular data

Cited in **1** Review
Cited in **53** Documents

Keywords:

[Kruzhkov entropy solution](#); [scalar conservation law](#); [uniqueness](#)

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