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On a model for continuous sedimentation in vessels with discontinuous cross-sectional area.
(English) [Zbl 1059.76542](#)

Hou, Thomas Y. (ed.) et al., Hyperbolic problems: Theory, numerics, applications. Proceedings of the ninth international conference on hyperbolic problems, Pasadena, CA, USA, March 25–29, 2002. Berlin: Springer (ISBN 3-540-44333-9/hbk). 397-406 (2003).

Summary: We study a clarifier-thickener unit considering that its cross-sectional area is not constant in both the clarification and the thickening zones. A mathematical model of sedimentation in such a vessel can be formulated as an initial value problem for a scalar conservation law with a nonconvex spatially varying flux and several types of discontinuities with respect to the space variable. Weak solutions of this non-standard conservation law are approximated by an extension of the well-known Engquist-Osher scheme. The key new ingredient is the discretization of the discontinuous flux parameters on a staggered grid against that of the conserved (sought) variable. The mathematical model and the numerical scheme are illustrated by a number of simulations.

For the entire collection see [\[Zbl 1024.00068\]](#).

MSC:

[76T20](#) Suspensions

[76M20](#) Finite difference methods applied to problems in fluid mechanics

Cited in **7** Documents