

ON AN UPWIND DIFFERENCE SCHEME FOR STRONGLY DEGENERATE PARABOLIC EQUATIONS.

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We prove the convergence of an explicit monotone finite difference scheme approximating an initial-boundary value problem for a spatially one-dimensional quasi-linear strongly degenerate parabolic equation, which is supplied with two zero-flux boundary conditions. This problem arises in a model of sedimentation-consolidation processes in centrifuges and vessels with varying cross-sectional area. We formulate the definition of entropy solution of the model in the sense of Kružkov and prove the convergence of the scheme to the unique BV entropy solution of the problem. The scheme and the model are illustrated by numerical examples.

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