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Numerical Analysis and Simulation of Nonisothermal Two-phase Flow in Porous Media

Communication Info

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(1) Finite volume
(2) Vertex-Centered
(3) TPFA
(4) porous media
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Abstract

In this work, we propose two finite volume schemes. A vertex-centered CVFE scheme [1,2] for an immiscible and incompressible non-isothermal two-phase flow model in a porous medium. The second is a TPFA-type scheme [3, 4] and has been used for the compressible non-isothermal water-gas two-phase model. Under some assumptions about the physical data and the mesh, we have shown that both schemes respect the maximum principle for saturation and temperature. On the basis of a priori estimates, and compactness arguments, we have established the convergence of the solution approximated by the two schemes to a weak solution of the continuous problem [5,6]. Finally, using the DuMuX platform [7], numerical simulations will be presented for the incompressible model (2pni) and the compressible water-gas model with phase exchange (2p2cni).

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