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Adaptive Mesh Refinement with the Enhanced Velocity Mixed Finite Element Method for Multiphase Flow

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In this work we consider a mixed finite element formulation using the enhanced velocity (EV) method to construct a strongly flux-continuous velocity approximation on spatially non-conforming grids. The EV method was recently generalized to semi-structured grids, in which each subdomain represents its own mesh refinement level of a structured grid with arbitrary inactive cells. The union of all subdomains forms a non-overlapping decomposition of the entire domain, and adaptive mesh refinement allows this decomposition to dynamically change at every time step to locally resolve sharp fronts. This approach will be demonstrated in an equation-of-state compositional flow model.

References

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