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The traveling wavefront for foam flow in multi-layer porous media

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The injection of foams into porous media has gained importance as a method of controlling gas mobility. The multilayer structure of the porous medium raises a question about its efficiency in dealing with layers of different permeabilities. The present work shows the existence of a single traveling wavefront in a two-layer porous medium for a simplified model derived from a realistic two-dimensional one. Besides the necessary conditions for the solution's existence, we prove that the traveling wave velocity is a weighted average of the velocities as if both layers were isolated. All theoretical estimates were validated through one- and two-dimensional simulations. Finally, we estimated the order of magnitude of the characteristic time the traveling wavefront needs to stabilize.

Participation

In-Person

References

The traveling wavefront for foam flow in two-layer porous media
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