

Numerical Analysis of Traveling Waves in Flow of Porous Media

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Abstract:

Riemann problems play a fundamental role on the analysis of solutions to PDEs in fluid dynamics. Solving such problems numerically demands a vast amount of mathematical tools, as well as considerable computation power: travelling wave solutions require solving systems of ODEs, which are defined using points of curves generated by contour packages. Many times such tasks have to be executed iteratively respecting entropy conditions, which in turn generate complicated algorithms. Our work focuses on analyzing and exposing some of these algorithms: in particular, we focus on solving riemann problems using transitional connections.