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# CORRECTNESS OF A NON-LINEAR PARABOLIC PROBLEM WITH UNKNOWN MOVING BOUNDARY, DESCRIBING DISPLACEMENT OF TWO WEAKLY COMPRESSIBLE VISCOUS FLUIDS IN THE POROUS MEDIUM

**Abstract**

*The one-dimensional problem of the displacement of weakly compressible viscous fluids with unknown free boundaries is considered in the work. The domain of displacement consists of three zones: water, water-oil and oil. In the non-uniform rectangular domain, using the combinations of the explicit and implicit difference schemes and the method of Newman's spectrum stability the error of approximation is defined and the condition of stability and monotonicity of the solution is proved.*