

SOLUTION BY GROUP INVARIANT METHOD OF INSTABILITY PHENOMENON ARISING IN FLUID FLOW THROUGH POROUS MEDIA

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Abstract

The present paper analytically discusses the phenomena of flow of two immiscible liquids through homogeneous porous media with capillary pressure by employing a Group theoretic analysis method. The problem has great importance in petroleum technology. The underlying basic assumption made in the present analysis is that the individual pressure of the two flowing phases may be replaced by their common mean pressure. The mathematical formulation leads to a nonlinear differential equation which is solved by Group invariant method. Group invariant method is generalization of similarity transformation method. Numerical calculation and its graphical representation is obtained by using Matlab coding.