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SOLUTION BY GROUP INVARIANT METHOD OF INSTABILITY PHENOMENON WITH POWERLAW NONLINEARITY

M. N. MEHTA, N. B. DESAI AND M. S. JOSHI

Abstract

The present paper analytically discusses the phenomena of flow of two immiscible liquids through homogeneous porous media with capillary mean 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 governing equation of instability phenomenon is obtained in the form of partial differential equation with power-law nonlinearity. This is solved by Group invariant method. Group invariant method [3] is generalization of similarity transformation method. Numerical calculation and its graphical representation is obtained by using Mat lab coding.

Key Words: Instability phenomenon, Power law nonlinearity, Group invariant method.