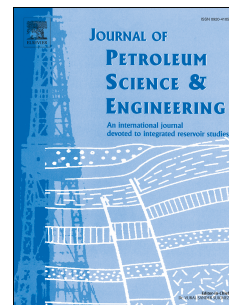


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On the efficiency of the IMPES method for two phase flow problems in porous media

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Abstract

In this work, we show a method to efficiently solve the multiphase flow through a porous media in the near wellbore region. The numerical discretisation is based on the IMplicit Pressure Explicit Saturation (IMPES) approach.

While most of the works in the literature rely on Fully Implicit Methods (FIM) to simulate the reservoir, this is not suited for the near wellbore region, where smaller computational and physical times are required, therefore parametric models with history matching are used in this zone. However, parametric models present several uncertainties that can affect the estimation of the pressure drop. An accurate and fast simulation of that region is therefore required.

Here, we propose a new and robust implementation of the IMPES scheme, aiming to reduce the large computational cost of the (implicit) pressure system of equations and increase the robustness and reliability of the scheme. The method takes advantage of the short physical time steps between iterations, observed in the near wellbore region, to produce a new pressure

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