Mathematical, Numerical and Computational Models of Compositional Oil Based On Streamlines

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In this work, the governing equations of a three phase compositional model well-posed for the streamline simulation (SLS) are presented. The SLS technique is used to solve the transport equations as a set of 1D problems. In order to use SLS, an IMPES type algorithm must be used. At the beginning of each time iteration, a pressure equation is solved on a computational 3D mesh to know the pressure and the velocity fields. The pressure equation is solved using the finite volume method. Using the velocity field, the trajectory of the streamlines can be traced. We solve the transport equations for each component on each streamline, without transverse effects to streamlines, such as gravity and capillarity. These transverse fluxes are treated using the operator splitting method. An *in-house* PVT program is used to perform flash calculations and to compute phase properties using several equations of state. Although SLS is a technique to solve the equations of the model, it also provides a good visualization tool to identify poor drainage zones.

This abstract is for the Mathematical and numerical modeling of enhanced oil recovery session.