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Dispersive effects on multicomponent transport through porous media[1] SOURAV DUTTA, PRABIR DARIPA, Texas A and M University — We use a hybrid numerical method to solve a global pressure based porous media flow model of chemical enhanced oil recovery. This is an extension of our recent work [1,2]. The numerical method is based on the use of a discontinuous finite element method and the modified method of characteristics. The impact of molecular diffusion and mechanical dispersion on the evolution of scalar concentration distributions are studied through numerical simulations of various flooding schemes. The relative importance of the advective, capillary diffusive and dispersive fluxes are compared over different flow regimes defined in the parameter space of Capillary number, Peclet number, longitudinal and transverse dispersion coefficients. Such studies are relevant for the design of effective injection policies and determining optimal combinations of chemical components for improving recovery.

[1] P. Daripa, S. Dutta, Modeling and simulation of surfactant-polymer flooding using a new hybrid method, J. Comput. Phys., 335, 249-282 (2017).

[2] P. Daripa, S. Dutta, Convergence analysis of a characteristics-based hybrid method for multicomponent transport in porous media, arXiv:1707.00035 [math.NA] (2017).

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