**TransPore Version 1.0 01/25/2017**

* A FEM-FDM solver for two-phase, multicomponent transport in porous media

GENERAL USAGE NOTES

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* Requirements: MATLAB 2017a or higher, Windows/Linux/MacOS
* E-mail: [sdutta.math@gmail.com](mailto:sdutta.math@gmail.com), [daripa@math.tamu.edu](mailto:daripa@math.tamu.edu)
* Copyright 2010-2018 TransPore developers and contributors. All rights reserved.
* References:
  + Daripa, P. & Dutta, S. (2017) Modeling and simulation of surfactant–polymer flooding using a new hybrid method. *J. Comput. Phys.*, **335**, 249–282.

<https://doi.org/10.1016/j.jcp.2017.01.038>

* + Daripa, P. & Dutta, S. (2017) Convergence analysis of a characteristics-based hybrid method for multicomponent transport in porous media, [**arXiv:1707.00035v1**](https://arxiv.org/abs/1707.00035v1) **[math.NA]**, 1–30.
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Primary SOURCE FILE

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*Master\_surf\_grid.m*

***Variables and Data Structure****:*

*nsim* - number of different flooding simulations

*sizeofgrid* - Nx x Ny grid sizes for each simulation

*c0iter, g0iter* - nsim arrays of concentrations of components 1 & 2 respectively in the injected fluid for each simulation

*f* - source term for the elliptic problem. Nx x Ny matrix with non-zero intensities at injection and production wells

*KK* - Nx x Ny matrix with absolute permeability values for the domain

*UU, CC, GG* - Nx x Ny matrices for space-time values of wetting phase saturation, components 1 & 2 concentrations respectively

*miuw, miuo* - wetting and non-wetting fluid base viscosities respectively

*swr0, sor0* - wetting and non-wetting phase initial residual saturations respectively

*sigma* - Nx x Ny matrix for interfacial tension values over the domain

*miua* - Nx x Ny matrix for aqueous phase saturation values over the domain

*lamba\_a, lambda\_o* - Nx x Ny matrices for wetting phase and non-wetting phase mobility values over the domain

*u,v* - Nx x Ny matrices for x-direction and y-direction total velocity values over the domain. Note: These are obtained by solving the global pressure equation and are different from phase velocities

Secondary SOURCE FILES

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*KKdef()* - function implementing different types of homogeneous, heterogeneous, stochastic, piecewise constant absolute permeability profiles

*s0c0()* - function implementing initial configurations and injection profiles for each simulation.

*compvis(), compres(), compmob()* - functions to update phase viscosities, phase residual saturations and phase mobility values with the evolution of state variables

*setGrid(), setRightHand(), setA(), setB(), getu(), get\_vn()* - functions implementing various parts of the elliptic solver for the global pressure and total velocities

*nmmoc\_surf\_mod\_neumann()* - function implementing the MMOC-FD procedure for solving the component transport equations