

Hamdi Tchelepi

Professor & Chair
Department of Energy Resources Engineering
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Experience

- 7/2003 – Faculty
Energy Resources Engineering Department
Stanford University, Stanford, CA.
- 3/1994 – 7/2003 Research Scientist, Reservoir Simulation Research Team,
Chevron Energy Technology Company (ETC),
La Habra, then San Ramon, CA.
Various Research Positions including Staff Research Scientist.

Education

- 9/1988 – 3/1994 Stanford University, Stanford, CA.
Ph.D in Petroleum Engineering.
Dissertation: ‘Viscous Fingering, Gravity Segregation and Permeability Heterogeneity in Two-Dimensional and Three-Dimensional Flows’.
- 9/1985 – 6/1988 King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia.
M.Sc in Petroleum Engineering.
Thesis: ‘The Effect of Electroosmosis on the Relative Permeability of Sandstones’.
- 9/1981 – 6/1985 University of Petroleum and Minerals, Dhahran, Saudi Arabia.
B.Sc in Petroleum Engineering.

University Service

- 1/2016 - Present Council Member, School of Earth Sciences, Stanford
- 9/2010 - 9/2018 Co-Director, Stanford Center for Computational Earth &
Environmental Science (CEES)
- 1/2010 - Present Co-Director, Stanford Earth Sciences Algorithms & Architectures
Initiative (SES-AAI)
- 1/2006 - Present Co-Director, Reservoir Simulation Industrial Affiliates Consortium
(SUPRI-B)
- 1/2004 - 1/2017 Graduate Admissions Committee, Energy Resources Engineering

Awards

- President Individual Achievement Award, from the Chevron & Schlumberger companies for Successful Completion of the Research Phase of INTERSECT - the Next-Generation Industrial Reservoir Simulator.
- Stanford University's 1994 Nominee for the Council of Graduate Schools Distinguished Dissertation Award.
- Edmund Littlefield Fellow for 1993-1994.
- 1989 SPE Western Region Graduate Fellowship Award.
- B.Sc Degree Conferred with Highest Honors.
- Top Rank: Undergraduate Petroleum Engineering Class.

Professional Activities (2007 - Present)

Conferences and Workshops:

- Organizing Committee: EAGE Workshop on High Performance Computing for Upstream, Crete, Greece (September, 2014)
- Chair, Gordon Research Conference (GRC) on Flow & Transport in Permeable Media, Bates College, Maine (July, 2014)
- Vice Chair, Gordon Research Conference on Flow & Transport in Permeable Media (June, 2012)
- Organizing Committee: SEG Workshop on High Performance Computing in the Geosciences, Berkeley, CA (July, 2011)
- Chair, SPE Reservoir Simulation Symposium (February, 2011)
- Organizing Committee: Gordon Research Conference on Modeling Flow & Transport in Permeable Media (2000–2016)
- Organizing Committee: SPE Reservoir Simulation Symposium (2000–2016)
- Board Member, SPE Digital Energy Technical Section (2009–2011)

Editorial Board of Refereed Journals:

- SIAM Journal on Multiscale Modeling & Simulation
- Journal of Computational Science
- SPE Journal
- Transport in Porous Media

Invited Talks & Presentations:

- University of Pau, Pau (June, 2017)
- Institute of Fluid Dynamics, UPMC, Paris (June, 2017)
- Petroleum and Geosystems Engineering, UT Austin (Dec., 2016)
- Workshop on Pore-Scale Modeling, Pau (June 2016)
- Keynote, Heriot-Watt University, Institute of Petroleum Engineering)
 - 40th Anniversary, Edinburgh, Scotland (March 2016)
- Invited Speaker and Panelist, SPE Reservoir Simulation Conference, Abu-Dhabi, (Sept. 2015)
- Co-Taught Annual Short Course on Reservoir Simulation, Stanford (July, 2003-2015)
- Invited Speaker, ENI Technology Center, San Donato, Italy (June, 2012)
- Invited Speaker, Polytecnico University, Milan, Italy (June, 2012)
- Invited Speaker & Panelist, SPE Research & Development Conference (RDC), Austin, TX, (June, 2011)
- Invited Speaker, Petroleum Institute (PI) Research Workshop, Abu-Dhabi, UAE (May, 2011)

- Invited Speaker, Aramco-KFUPM-Stanford Meeting on Research Directions, Dhahran, Saudi Arabia (March, 2011).
- Invited Speaker, Gordon Research Conference (GRC) on Flow in Permeable Media, Bates College, Maine (July 2010)
- Co-Taught Short Course on Reservoir Simulation, Stanford (July, 2010)
- Taught Short Course on Reservoir Simulation, ENI, Milan, Italy (March, 2010)
- Keynote Speaker, Workshop on Modeling and Risk Assessment of Geological Storage of CO₂, Svalbard, Norway (August, 2009)
- Co-Taught Short Course on Reservoir Simulation, Stanford (July, 2009)
- Keynote Speaker, International Conference on Preferential and Unstable Flow in Porous Media, Monte Verita, Switzerland, (March, 2009)
- Guest Co-Editor, Computational Geosciences, Special Issue on “Multiscale Methods for Flow in Heterogeneous Porous Media”, (October, 2008)
- Invited Speaker, Petroleum Institute, Abu-Dhabi, UAE (September, 2008)
- Keynote Speaker, CMWR (Computational Methods in Water Resources) XVII International Conference, San Francisco (July, 2008)
- Invited Speaker, SPE Chapter & Aramco Advanced Research Center Dhahran, Saudi Arabia (March, 2008)
- Invited Speaker, Dept. of Civil & Environmental Engineering USC, Los Angeles (March, 2008)
- Taught Short Course on Reservoir Simulation, ENI, Milan, Italy (2008)
- Invited Speaker, Workshop on Numerical Discretization and Upscaling methods Princeton University, Princeton, NJ, (November, 2007)
- Invited Speaker, SEG Workshop on CO₂ Sequestration and Monitoring, San Antonio, TX (Sept., 2007)
- Invited Speaker, ExxonMobil Research Lab, Houston, TX (May, 2007)
- Invited Speaker, Structural Engineering and Geomechanics Seminar, Stanford, CA (2007)
- Invited Lecture Series, Aramco Advanced Research Center, Dhahran, Saudi Arabia (September, 2007)
- Invited Speaker, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia (September, 2007)
- Panel Member, SIAM Conference on Computational Science & Engineering, CS & E Education, Costa Mesa (2007)
- Invited Participant: DOE Basic Energy Sciences (BES): Basic Research Needs for Geosciences: Facilitating 21st Century Energy Systems, (Feb., 2007)
- Invited Speaker, (Several Talks) Inaugural Conference on Computational Methods in Energy and Environmental Research (CMEER), Beijing, China (July, 2007)
- Taught Short Course on Reservoir Simulation, Milan, Italy (2007)
- Co-Taught Annual Short Course on Reservoir Simulation, Stanford University, (2007)

Professional Society Membership:

- SPE, AGU, APS, & SIAM

Ph.D. Advisees (Graduated)

Yang Wong - co-advised with Prof. Roland Horne (December, 2018)
'Sequential Implicit Newton method for Geothermal Reservoir Simulation'.

Michael Connelly - (March, 2018)
'Nonlinear Trust-Region Solvers for Thermal Processes'.

Rui (Forest) Jiang - co-advised with Lou Durlofsky (March, 2018)
'Accelerating Oil-Water Subsurface Flow Simulation Through
Reduced-Order Modeling and Advances in Nonlinear Analysis'.

Ruslan Rin (October, 2017)
'Implicit Coupling Framework for Multi-Physics Reservoir Simulation'.

Moataz Abu Al-Saud (September, 2017)
'Direct Numerical Simulation of Immiscible Two-Phase Flow at the Pore Scale'.

Francois Hamon (January, 2017)
'Implicit Hybrid Upwinding and Advanced Nonlinear Solver for Multiphase
Flow and Transport in Porous Media'.
Awarded: The 2017 Ramey Fellowship (recognizes most prominent research
in the Energy Resources Engineering Department)

Fay Ibrahima (August, 2016)
'Stochastic PDF methods for Uncertainty Quantification of
Subsurface Flow Performance Predictions'.

Sara Farshidi - co-advised with Prof. Lou Durlofsky (April, 2016)
'Modeling Reactive Multi-Component Multiphase Transport in Porous Media'.

Amir Salehi (December, 2015)
'Upscaling of Compositional Displacements in Heterogenous Reservoirs'.

Abdulrahman Manea (December, 2015)
'Parallel Multigrid and Multiscale Flow Solvers For
High-Performance-Computing Architectures'.

Yixuan Wang (December, 2015)
'Algebraic Multiscale Solver for Generally Unstructured Grids'.

Rustem Zaydullin (June, 2015)
'Compositional Space Parameterization Methods for
Thermal-Compositional Simulation'.

Boxiao Li - co-advised with Sally Benson (November, 2014)
'Modeling Geological CO₂ Sequestration: Translation Across Spatial
Scales and Advances in Nonlinear Solvers'.

Guillaume Moog (June, 2013)
'Advanced Discretization Methods for Flow Simulation using Unstructured Grids'.

Mohammad Shahvali (December, 2012)
'Sequential Implicit Methods for Coupled Flow and Transport

in Porous Media’.

Xiaochen Wang (November, 2012)
‘Trust-Region Newton Solver for Multiphase Flow and
Transport in Porous Media.

Yifan Zhou - co-advised with Prof. Khalid Aziz (November, 2012)
‘Automatic Differentiation for General-Purpose Simulation of Reservoirs
and Advanced Wells’.

Alireza Iranshahr (March, 2012)
‘Tie-Simplex Simulation Framework for Thermal-Compositional Displacements’.
Awarded: 2010 Ramey Fellowship (recognizes most prominent research
in the Energy Resources Engineering Department)

Rami Younis - co-advised with Prof. Khalid Aziz (June, 2011)
‘Automatic Differentiation and Globally Convergent Nonlinear Solvers
for Multiphase Flow in Porous Media’.
Awarded: 2008 Ramey Fellowship (recognizes most prominent research
in the Energy Resources Engineering Department)

Pipat Likanapaisal (May, 2010)
‘Statistical Moment Equations for Forward and Inverse Modeling
of Multiphase Flow in Porous Media’.

Yaqing Fan - co-advised with Prof. Lou Durlofsky (May, 2010)
‘Chemical Reaction Modeling in a Subsurface Flow Simulator with
Application to In-Situ Upgrading and CO₂ Mineralization’.

Hui Zhou (March, 2010)
‘Algebraic Multiscale Finite-Volume Methods for Reservoir Simulation’.

Jihoon Kim (March, 2010)
‘Sequential Methods for Coupled Geomechanics and Multiphase Flow’.

Anshul Agarwal (June, 2009)
‘Adaptive Implicit Method for Thermal-Compositional Flows’.

Sebastien Matringe (February, 2008)
‘Mixed Finite-Element Methods for Discretization and Streamline Tracing’.
Winner: 2008 International SPE Student Paper Contest (PhD Division).

Marc Hesse - co-advised with Lynn Orr (January, 2008)
Dissertation: ‘Mathematical Modeling and Multiscale Simulation of CO₂
Storage in Saline Aquifers’.

Yuanlin Jiang - co-advised with Prof. Khalid Aziz (December, 2007)
‘Techniques for General-Purpose Simulation of Reservoirs
and Advanced Wells’.
Awarded: 2007 Ramey Fellowship (recognizes most prominent research
in the Energy Resources Engineering Department).

Felix Kwok (December, 2007)

‘Scalable Linear and Nonlinear Algorithms for Multiphase Flow in Porous Media’.

Current Ph.D Advisees

Karine Levonyan (Expected June, 2019)

‘Multiscale Formulation for Coupled Geomechanics and Flow in Naturally Fractured Reservoirs’.

Timothy Yeo - (Expected: June, 2020)

‘Coupled Nonlinear Thermal-Mechanics in Heterogeneous Porous Formations’.

Sergey Klevtsov - (Expected: June, 2020)

‘Multiscale Linear Solver for Coupled Flow and Geomechanics’.

Jie Yang - co-advised with Prof. Tony Kovalcsik (Expected: June, 2020)

‘Phase-Field Model for Fracture Propagation in Heterogeneous Porous Media’.

Ouassim Khebzegga - (Expected: June, 2020)

‘Three-Phase Relative Permeability Models for Near-Miscible Displacements’.

Olga Fuks - (Expected: June, 2020)

‘Distribution Method for Uncertainty Quantification of Compositional Displacements’.

Soheil Ismaeialzadeh - (Expected: June, 2020)

‘Level-Set Method for the Moving Contact Line Problem in Complex Geometry’.

Sebastian Bosma - (Expected: June, 2020)

‘Adaptive Localization for Flow and Transport in Heterogeneous Formations’.

Hyung Yang - co-advised with Prof. Daniel Tartakovsky (Expected: June, 2021)

‘Uncertainty Quantification for Flow in Heterogeneous Formations’.

Ruixiao Sun - (Expected: June, 2021)

‘Compositional Space Parameterization for Compositional Three-Phase Displacements’.

Cedric Fraces - (Expected: June, 2021)

‘Data and Physics Based Uncertainty Quantification’.

Jiawei Li - (Expected: June, 2021)

‘Multi-Segment Well Modeling in a Sequential Implicit Coupling Framework’.

Ruixiao Sun - (Expected: June, 2021)

‘Thermal-Compositional Reservoir Simulation Based on Tie-Simplex Representation’.

Jaewoo An - (Expected: June 2022)

‘Nonlinear Solvers for Coupled Multiphase Flow and Geomechanics’.

Post-Docs & Research Associates

Andrea Franceschini (2018 - Present)

Mamadou N'Diaye (2018 - Present)
Igor Shovkun (2018 – Present)
Qingwang (Kevin) Yuan (2017 - Present)
Jiamin Jiang (2017 - Present)
Yashar Mehmani (2015 - Present)
Pavel Tomin (2015 – Present)
Timur Garipov (2010 – 2018)
Bo Guo (2015 - 2018)
Kirill Terekhov (2014 – 2017)
Cyprien Soullaine (2013 – 2017)
Nicola Castelletto (2013 – 2018)
Ahmad Abu-Shika (2015 – 2017)
Per Pettersson (2013 – 2014)
Xavier Tunc (2012 – 2014)
Hadi Hajibeygi (2011 – 2012)
Rami Younis (2011 – 2012)
Daniel Meyer (2008 – 2010)
Jianlin Fu - with Jef Caers (2008 – 2010)
Amir Riaz (2003 – 2007)
Liyong Li (1998 – 2000)

Teaching

Energy 121/221 - Fundamentals of Multiphase Flow (Annual, Winter, 2003-2018)
Energy 223 - Reservoir Simulation (Annual, Winter, 2004-2018)
Energy 224 - Advanced Reservoir Simulation (Annual, Fall, 2004-2018)
Energy 246 - Reservoir Characterization & Flow Modeling (Annual, Fall, 2006-2012)
Energy 175 - Well Test Analysis (Spring, 2005)
Energy 180/280 - Production Engineering (Spring 2004 & 2006)

Publications

Only Granted U.S.A Patents are listed below. U.S.A Patent Applications, Non-U.S. Patents and Patent Applications are not listed.

Refereed Publications

- [1] Pan, H., Connolly, M., and Tchelepi, H.: “Multiphase Equilibrium Calculation Framework for Compositional Simulation of CO₂ Injection in Lowerature Reservoirs,” *Industrial and Engineering Chemistry Research* (2019) **58**, No. 5, 2052–2070.
- [2] Mehmani, Y. and Tchelepi, H. A.: “Multiscale computation of pore-scale fluid dynamics: Single-phase flow,” *Journal of Computational Physics* (2018) **375**, 1469–1487.
- [3] Jiang, J. and Tchelepi, H. A.: “Dissipation-based continuation method for multiphase flow in heterogeneous porous media,” *Journal of Computational Physics* (2018) **375**, 307–336.
- [4] Myner, O. and Tchelepi, H. A.: “A mass-conservative sequential implicit multiscale method for isothermal equation-of-state compositional problems,” *SPE Journal* (2018) **23**, No. 6, 2376–2393.
- [5] Guo, B., Ma, L., and Tchelepi, H. A.: “Image-based micro-continuum model for gas flow in organic-rich shale rock,” *Advances in Water Resources* (2018) **122**, 70–84.
- [6] Soulaïne, C., Roman, S., Kovscek, A., and Tchelepi, H. A.: “Pore-scale modelling of multiphase reactive flow: Application to mineral dissolution with production of CO₂,” *Journal of Fluid Mechanics* (2018) **855**, 616–645.
- [7] Delgosaie, A. H., Glynn, P. W., Jenny, P., and Tchelepi, H. A.: “A Flexible Temporal Velocity Model for Fast Contaminant Transport Simulations in Porous Media,” *Water Resources Research* (2018) **54**, No. 10, 8500–8513.
- [8] Alzayer, A. N., Voskov, D. V., and Tchelepi, H. A.: “Relative Permeability of Near-Miscible Fluids in Compositional Simulators,” *Transport in Porous Media* (2018) **122**, No. 3, 547–573.
- [9] Ibrahima, F., Tchelepi, H. A., and Meyer, D. W.: “An efficient distribution method for nonlinear two-phase flow in highly heterogeneous multidimensional stochastic porous media,” *Computational Geosciences* (2018) **22**, No. 1, 389–412.
- [10] Castelletto, N., Klevtsov, S., Hajibeygi, H., and Tchelepi, H.: “Multiscale two-stage solver for Biot’s poroelasticity equations in subsurface media,” *Computational Geosciences* (2018).
- [11] Abu-Al-Saud, M. O., Popinet, S., and Tchelepi, H. A.: “A Conservative and Well-Balanced Surface Tension Model,” *Journal of Computational Physics* (2018).
- [12] Hamon, F. P., Mallison, B. T., and Tchelepi, H. A.: “Implicit Hybrid Upwinding for Two-Phase Flow In Heterogeneous Porous Media with Buoyancy and Capillarity,” *Computer Methods in Applied Mechanics and Engineering* (2018) **331**, 701–727.
- [13] Schneider, M., Flemisch, B., Helmig, R., Terekhov, K., and Tchelepi, H. A.: “Monotone Nonlinear Finite-Volume Method for Challenging Grids,” *Computational Geosciences* (2018) **22**, No. 2, 565–586.
- [14] Bosma, S., Hajibeygi, H., Tene, M., and Tchelepi, H. A.: “Multiscale Finite Volume Method for Discrete Fracture Modeling on Unstructured Grids,” *Journal of Computational Physics* (2017) **351**, 145–164.
- [15] Soulaïne, C., Roman, S., Kovscek, A., and Tchelepi, H. A.: “Mineral Dissolution and Wormholing from a Pore-Scale Perspective,” *Journal of Fluid Mechanics* (2017) **827**, 457–483.
- [16] Graveleau, M., Soulaïne, C., and Tchelepi, H. A.: “Pore-Scale Simulation of Interphase Multicomponent Mass Transfer for Subsurface Flow,” *Transport in Porous Media* (2017) **120**, No. 2, 287–308.
- [17] Roman, S., Abu-Al-Saud, M. O., Tokunaga, T., Wan, J., Kovscek, A. R., and Tchelepi, H. A.: “Measurements and Simulation of Liquid Films During Drainage Displacements and Snap-Off in Constricted Capillary Tubes,” *Journal of Colloid and Interface Science* (2017) **507**, 279–289.

- [18] Mehmani, Y., Burnham, A. K., Vanden Berg, M. D., and Tchelepi, H. A.: “Quantification of Organic Content in Shales Via Near-Infrared Imaging: Green River Formation,” *Fuel* (2017) **208**, 337–352.
- [19] Mehmani, Y. and Tchelepi, H. A.: “Minimum Requirements for Predictive Pore-Network Modeling of Solute Transport In Micromodels,” *Advances in Water Resources* (2017) **108**, 83–98.
- [20] Abushaikha, A. S., Voskov, D. V., and Tchelepi, H. A.: “Fully Implicit Mixed-Hybrid Finite-Element Discretization for General Purpose Subsurface Reservoir Simulation,” *Journal of Computational Physics* (2017) **346**, 514–538.
- [21] Liao, Q., Zhang, D., and Tchelepi, H. A.: “Nested Sparse Grid Collocation Method with Delay and Transformation for Subsurface Flow and Transport Problems,” *Advances in Water Resources* (2017) **104**, 158–173.
- [22] Moncorge, A., Tchelepi, H. A., and Jenny, P.: “Modified Sequential Fully Implicit Scheme for Compositional Flow Simulation,” *Journal of Computational Physics* (2017) **337**, 98–115.
- [23] Abu-Al-Saud, M. O., Riaz, A., and Tchelepi, H. A.: “Multiscale Level-Set Method for Accurate Modeling of Immiscible Two-Phase Flow with Deposited Thin Films on Solid Surfaces,” *Journal of Computational Physics* (2017) **333**, 297–320.
- [24] Zaydullin, R., Voskov, D. V., and Tchelepi, H. A.: “Comparison of EoS-Based and K-Values-Based Methods for Three-Phase Thermal Simulation,” *Transport in Porous Media* (2017) **116**, No. 2, 663–686.
- [25] Castelletto, N., Hajibeygi, H., and Tchelepi, H. A.: “Multiscale Finite-Element Method for Linear Elastic Geomechanics,” *Journal of Computational Physics* (2017) **331**, 337–356.
- [26] Terekhov, K. M., Mallison, B. T., and Tchelepi, H. A.: “Cell-Centered Nonlinear Finite-Volume Methods for the Heterogeneous Anisotropic Diffusion Problem,” *Journal of Computational Physics* (2017) **330**, 245–267.
- [27] Liao, Q., Zhang, D., and Tchelepi, H. A.: “A Two-Stage Adaptive Stochastic Collocation Method on Nested Sparse Grids for Multiphase Flow in Randomly Heterogeneous Porous Media,” *Journal of Computational Physics* (2017) **330**, 828–845.
- [28] Soulaire, C. and Tchelepi, H. A.: “Micro-Continuum Approach for Pore-Scale Simulation of Subsurface Processes,” *Transport in Porous Media* (2016) **113**, No. 3, 431–456.
- [29] Zaydullin, R., Voskov, D. V., and Tchelepi, H. A.: “Comparison of EoS-Based and K-Values-Based Methods for Three-Phase Thermal Simulation,” *Transport in Porous Media* (2016) 1–24.
- [30] Hamon, F. P., Mallison, B. T., and Tchelepi, H. A.: “Implicit Hybrid Upwind Scheme for Coupled Multiphase Flow and Transport with Buoyancy,” *Computer Methods in Applied Mechanics and Engineering* (2016) **311**, 599–624.
- [31] Mehmani, Y., Burnham, A., and Tchelepi, H.: “From Optics to Upscaled Thermal Conductivity: Green River Oil Shale,” *Fuel* (2016) **183**, 489–500.
- [32] Hamon, F. P. and Tchelepi, H. A.: “Analysis of Hybrid Upwinding for Fully-Implicit Simulation of Three-Phase Flow with Gravity,” *SIAM Journal on Numerical Analysis* (2016) **54**, No. 3, 1682–1712.
- [33] Soulaire, C., Gjetvaj, F., Garing, C., Roman, S., Russian, A., Guze, P., and Tchelepi, H. A.: “The Impact of Sub-Resolution Porosity of X-Ray Microtomography Images on the Permeability,” *Transport in Porous Media* (2016) **113**, No. 1, 227–243.
- [34] Hamon, F. P. and Tchelepi, H. A.: “Ordering-Based Nonlinear Solver for Fully-Implicit Simulation of Three-Phase Flow,” *Computational Geosciences* (2016) **20**, No. 3, 475–493.

- [35] Mehmani, Y., Burnham, A. K., Berg, M. D. V., Gelin, F., and Tchelepi, H. A.: “Quantification of Kerogen Content in Organic-Rich Shales from Optical Photographs,” *Fuel* (2016) **177**, 63–75.
- [36] Zaydullin, R., Voskov, D. V., and Tchelepi, H. A.: “Phase-State Identification Bypass Method for Three-Phase Thermal Compositional Simulation,” *Computational Geosciences* (2016) **20**, No. 3, 461–474.
- [37] Wang, Y., Hajibeygi, H., and Tchelepi, H. A.: “Monotone Multiscale Finite Volume Method,” *Computational Geosciences* (2016) **20**, No. 3, 509–524.
- [38] Manea, A., Sewall, J., and Tchelepi, H.: “Parallel Multiscale Linear Solver for Highly Detailed Reservoir Models,” *SPE Journal* (2016) **21**, No. 6, 2062–2078.
- [39] White, J., Castelletto, N., and Tchelepi, H.: “Block-Partitioned Solvers for Coupled Poromechanics: A Unified Framework,” *Computer Methods in Applied Mechanics and Engineering* (2016) **303**, 55–74.
- [40] Garipov, T., Karimi-Fard, M., and Tchelepi, H. A.: “Discrete Fracture Model for Coupled Flow and Geomechanics,” *Computational Geosciences* (2016) **20**, No. 1, 149–160.
- [41] Castelletto, N., White, J., and Tchelepi, H.: “Accuracy and Convergence Properties of the Fixed-Stress Iterative Solution of Two-Way Coupled Poromechanics,” *International Journal for Numerical and Analytical Methods in Geomechanics* (2015) **39**, No. 14, 1593–1618.
- [42] Roman, S., Soulaire, C., Abu-Al-Saud, M., Kavscek, A., and Tchelepi, H. A.: “Particle Velocimetry Analysis of Immiscible Two-Phase Flow in Micromodels,” *Advances in Water Resources* (2015).
- [43] Zaydullin, R., Voskov, D., and Tchelepi, H.: “Phase-State Identification Bypass Method for Three-Phase Thermal Compositional Simulation,” *Computational Geosciences* (2015).
- [44] Ibrahima, F., Meyer, D., and Tchelepi, H.: “Distribution Functions of Saturation for Stochastic Nonlinear Two-Phase Flow,” *Transport in Porous Media* (2015) **109**, No. 1, 81–107.
- [45] Elenius, M., Voskov, D., and Tchelepi, H.: “Interactions Between Gravity Currents and Convective Dissolution,” *Advances in Water Resources* (2015) **83**, 77–88.
- [46] Li, B. and Tchelepi, H.: “Nonlinear Analysis of Multiphase Transport in Porous Media in the Presence of Viscous, Buoyancy, and Capillary Forces,” *Journal of Computational Physics* (2015) **297**, 104–131.
- [47] Delgosaie, A., Meyer, D., Jenny, P., and Tchelepi, H.: “Non-Local Formulation for Multiscale Flow in Porous Media,” *Journal of Hydrology* (2015) **531**, 649–654.
- [48] Lee, S. H., Efendiev, Y., and Tchelepi, H. A.: “Hybrid Upwind Discretization of Nonlinear Two-Phase Flow with Gravity,” *Advances in Water Resources* (2015) **82**, 27–38.
- [49] Daniel, D., Riaz, A., and Tchelepi, H. A.: “Onset of Natural Convection in Layered Aquifers,” *Journal of Fluid Mechanics* (2015) **767**, 763–781.
- [50] Jenny, P., Lee, J., Meyer, D. W., and Tchelepi, H. A.: “Scale Analysis of Miscible Density-Driven Convection in Porous Media,” *Journal of Fluid Mechanics* (2014) **749**, No. 4, 519–541.
- [51] Wang, Y., Hajibeygi, H., and Tchelepi, H. A.: “Algebraic Multiscale Solver for Flow in Heterogeneous Porous Media,” *Journal of Computational Physics* (2014) **259**, 284–303.
- [52] Hajibeygi, H. and Tchelepi, H. A.: “Compositional Multiscale Finite-Volume Formulation,” *SPE Journal* (April 2014) **19**, No. 2, 316–326.
- [53] Rannou, G., Voskov, D. V., and Tchelepi, H. A.: “Tie-Line-Based K-Value Method for Compositional Simulation,” *SPE Journal* (DEC 2013) **18**, No. 6, 1112–1122.
- [54] Kim, J., Tchelepi, H. A., and Juanes, R.: “Rigorous Coupling of Geomechanics and Multiphase Flow with Strong Capillarity,” *SPE Journal* (DEC 2013) **18**, No. 6, 1123–1139.

- [55] Iranshahr, A., Voskov, D., and Tchelepi, H. A.: “A Negative-Flash Tie-Simplex Approach for Multi-phase Reservoir Simulation,” *SPE Journal* (DEC 2013) **18**, No. 6, 1140–1149.
- [56] Li, B., Tchelepi, H. A., and Benson, S.: “Influence of Capillary-Pressure Models on CO₂ Solubility Trapping,” *Advances in Water Resources* (2013) **62**, 488–498.
- [57] Wang, X. and Tchelepi, H. A.: “Trust-Region Based Solver for Nonlinear Transport in Heterogeneous Porous Media,” *Journal of Computational Physics* (2013) **253**, 114–137.
- [58] Maes, J., Moncorge, A., and Tchelepi, H. A.: “Thermal Adaptive Implicit Method: Time Step Selection,” *Journal of Petroleum Science and Engineering* (2013) **106**, 34–45.
- [59] Meyer, D., Tchelepi, H. A., and Jenny, P.: “A Fast Simulation Method for Uncertainty Quantification of Subsurface Flow and Transport,” *Water Resources Research* (2013) **49**, No. 5, 2359–2379.
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