Curriculum Vitae

Name: Trond Mannseth
Date of birth: 57.08.12
Nationality: Norwegian

Languages: Norwegian, English

Research areas:

Reservoir simulation, particularly:

- Discretization of partial differential equations
- Modeling of anisotropic and heterogeneous media

Inverse problems (current main focus), particularly:

- Data assimilation
- Multifidelity methods
- Uncertainty assessment

Education:

1986	Ph.D. in applied mathematics (acoustics), U. of Bergen
1983	Ms.Sc. in applied mathematics (acoustics), U. of Bergen
1982	Bs.Sc., U. of Bergen.

Professional experience:

1/10-18 -	Research Professor, NORCE Norwegian Research Centre-NORCE Energy
1/7-04 – 30/9-18	Chief Scientist, Uni CIPR-Centre for Integrated Petroleum Research
1/1-03 – 31/12-14	Adjunct Professor, Department of Mathematics, U. of Bergen
1/3-98 – 30/6-04	Chief Scientist, RF - Rogaland Research, Bergen
1/1-96 - 28/2-98	Senior Research Scientist, RF - Rogaland Research, Bergen
1/7-90 -31/12-95	Senior Research Scientist, Norsk Hydro Research Center, Bergen
1/1-85 - 31/6-90	Research Scientist, Norsk Hydro Research Center, Bergen
1/11-83 - 31/12-84	Research Assistant, Department of Mathematics, U. of Bergen

Project Management (major projects):

2011 - 2014	Robust inversion of CSEM data (VISTA)
2007 – 2010	Reservoir Monitoring and Dynamic Reservoir Characterization with Electromagnetic Data (VISTA)
2007 – 2011	Reservoir Monitoring and Dynamic Reservoir Characterization with Production, Seismic and Electromagnetic Data (NFR + Industry Consortium)
2005 – 2006	Inversion of Sea Bed Logging Electromagnetic Data for Hydrocarbon Detection (Rocksource ASA)
2002 – 2004	Reservoir Characterization and Prediction Uncertainty Assessment through Scale Splitting (NFR) (management ended prematurely due to change of position)
2001 – 2004	Modeling, monitoring and control of well-reservoir interaction (NFR) (management ended prematurely due to change of position)
2001 – 2004	Cost-efficient reservoir characterization (Industry consortium) (management ended prematurely due to change of position)
1999 – 2002	Systematic reservoir characterization (Norwegian Research Council – NFR)
1997 – 1998	Fluid flow properties of heterogeneous porous media (SAGA)

Editorial Board:

1999 – 2008	SPE Journal
2009 -	Computational Geosciences

Master Students:

Grad. 2011	Brede Bergo, Department of Mathematics, U. of Bergen
Grad. 2011	Kristian Fossum, Department of Mathematics, U. of Bergen
Grad. 2009	Hanne Christine Seyffarth, Department of Mathematics, U. of Bergen
Grad. 2008	Kjetil Johan Høiseth, Department of Mathematics, U. of Bergen

Ph.D. Students:

Grad. 2023	Mohammad Nezhadali, Department of Mathematics, U. of Bergen
Grad. 2015	Svenn Tveit, Department of Mathematics, U. of Bergen
Grad. 2015	Kristian Fossum, Department of Mathematics, U. of Bergen
Grad. 2014	Theophile Gentilhomme, Department of Geology, Universite de Lorraine
Grad. 2012	Andrey Kovalenko, Department of Mathematics, U. of Bergen
Grad. 2010	Shaaban Bakr, Department of Mathematics, U. of Bergen
Grad. 2005	Inga Berre, Department of Mathematics, U. of Bergen
Grad. 2005	Martha Økland Lien, Department of Mathematics, U. of Bergen
Grad. 2004	Harald Kruger, Department of Physics, U. of Bergen
Grad. 2002	Trygve Kastberg-Nilssen, Department of Mathematics, U. of Bergen
Grad. 1999	Kari Brusdal, Department of Mathematics, U. of Bergen
Grad. 1999	Alv-Arne Grimstad, Department of Physics, U. of Bergen

Post Docs:

2011-2013	Shaaban Bakr, Uni CIPR
2007-2011	Tao Feng, Uni CIPR
2005-2010	Martha Økland Lien, Uni CIPR
2001-2004	Steinar Evje, RF-Rogaland Research
2001-2004	Hege Urkedal, RF-Rogaland Research
1999-2001	Alv-Arne Grimstad, RF-Rogaland Research

Teaching Experience:

2007-2014	Mat265 - Parameter Estimation and Inverse Problems, Department of Mathematics, U. of Bergen
2006	Theory and Computational Methods for Inverse Problems, Department of Mathematics, U. of Bergen
1995	I161 – Numerical Analysis, Department of Informatics, U. of Bergen
1991	Mathematics II, Bergen College – Engineering Department
1990	Mathematics II, Bergen College – Engineering Department

Submitted manuscripts:

T. Mannseth, K. Fossum, S.I. Aanonsen: *Calculating Bayesian model evidence for porous-media flow using a multilevel estimator.*

T. Mannseth: *Multiscale model diagnostics.*

T. Bhakta, B. Paap, V. Vandeweijer, M. Lien, T. Mannseth: *Assessment of various geophysical data types for cost-efficient monitoring of CO_2 sequestration.*

Journal publications:

S.I. Aanonsen, K. Fossum, T. Mannseth: *Bayesian model evaluation for multiple scenarios*. Comput. Geosci. **27**(6), 2023.

M. Nezhadali, T. Bhakta, K. Fossum, T. Mannseth: *Sequential multilevel assimilation of inverted seismic data*. Comput. Geosci. **27**(2), 2023.

M. Nezhadali, T. Bhakta, K. Fossum, T. Mannseth: *Iterative multilevel assimilation of inverted seismic data*. Comput. Geosci., **26**(2), 2022.

S. Tveit, T. Mannseth: *Monitoring of large-scale CO_2 injection using CSEM, gravimetric, and seismic AVO data.* Geophysical Monitoring for Geological Carbon Storage, Geophysical Monograph 272, edited by Lianjie Huang, American Geophysical Union, John Wiley & Sons, 2022

M. Nezhadali, T. Bhakta, K. Fossum, T. Mannseth: *Multilevel assimilation of inverted seismic data with correction for multilevel modeling error.* Frontiers in Applied Mathematics and Statistics, section Mathematics of Computation and Data Science, published online June 1st 2021, https://doi.org/10.3389/fams.2021.673077

S. Tveit, T. Mannseth, J. Park, G. Sauvin, R. Agersborg: *Combining CSEM or gravity inversion with seismic AVO inversion, with application to monitoring of large-scale CO_2 injection.* Comput. Geosci., **24**(3), 2020

T. Mannseth: *Assimilation of multiple linearly dependent data vectors.* Comput. Geosci. **24**(1), 2020

K. Fossum, T. Mannseth, A.S. Stordal: *Assessment of multilevel ensemble based data assimilation for reservoir history matching.* Comput. Geosci. **24**(1), 2020

T. Mannseth, K. Fossum: *Assimilating spatially dense data for subsurface applications---balancing information and degrees of freedom*, Comput. Geosci. **22**(5), 2018

K. Fossum, T. Mannseth: *Coarse-scale data assimilation as a generic alternative to localization*. Comput. Geosci. **21**(1), 2017.

T. Gentilhomme, D.S. Oliver, T. Mannseth, G. Caumon, R. Moyen, P. Doyen: *Ensemble-based multi-scale history matching using second generation wavelet transform*. Comput. Geosci. **19**(5), 2015.

K. Fossum, T. Mannseth: *Assessment of ordered sequential data assimilation*. Comput. Geosci. **19**(4), 2015.

T. Mannseth: *Comparison of five different ways to assimilate data for a simplistic weakly non-linear parameter estimation problem*. Comput. Geosci. **19**(4), 2015.

S. Tveit, S. A. Bakr, M. Lien, T. Mannseth: *Ensemble-based Bayesian inversion of CSEM data for subsurface structure identification*. Geophys. J. Int. **201**(3), 2015

H. K. Hvidevold, G. Alendal, A. Ali, T. Johannessen, T. Mannseth, H. Avlesen: *Layout of CCS monitoring infrastructure with highest probability of detecting a footprint of a CO_2 leak in a varying marine environement*. Int. Journal of Greenhouse Gas Control **37**, (2015).

S. Tveit, S. A. Bakr, M. Lien, T. Mannseth: *Identification of subsurface structures using electromagnetic data and shape priors*. J. Comput. Phys. **284**, (2015).

K. Fossum, T. Mannseth: *Sampling capabilities of sequential and simultaneous data assimilation. Part I: analytical comparison*. Inverse Probl. **30**(11), 114002 (2014).

K. Fossum, T. Mannseth: *Sampling capabilities of sequential and simultaneous data assimilation. Part II: statistical analysis of numerical results*. Inverse Probl. **30**(11), 114003 (2014).

M. Lien, T. Mannseth: *Facies estimation trough data assimilation and structure parameterization*. Comput. Geosci. **18** (5), (2014).

T. Mannseth: *Relation between level set and truncated pluri-Gaussian methodologies for facies representation.* Math. Geosci. **46** (6), (2014).

S. A. Bakr, D. Pardo, T. Mannseth: *Domain decomposition Fourier finite element method for the simulation of 3D marine CSEM measurements*. J. Comput. Phys. **255**, (2013)

S. A. Bakr, T. Mannseth: *An approximate hybrid method for electromagnetic scattering from an underground target,* IEEE Trans. on Geoscience and Remote Sensing, **51** (1), (2013)

H. K. Hvidevold, G. Alendal, T. Johannessen, T. Mannseth: *Assessing model parameter uncertainties for rising velocity of CO_2 droplets through experimental design*, Int. Journal of Greenhouse Gas Control, **11**, (2012)

A. Kovalenko, T. Mannseth, G. Nævdal : *Sampling error distribution for the ensemble Kalman filter update step*, Comput. Geosci., **16** (2), 2012.

A. Kovalenko, T. Mannseth, G. Nævdal : *Error estimate for the ensemble Kalman filter analysis step*, SIAM J. Matrix Analysis and Applications **32** (4), 2011.

I. Berre, M. Lien, T. Mannseth : *Identification of three-dimensional electric conductivity changes from time-lapse electromagnetic observations*, J. Comput. Phys **230** (10), 2011.

T. Feng, T. Mannseth : *Impact of time-lapse seismic data for permeability estimation*, Comput. Geosci. **14** (4) 2010.

I. Berre, M. Lien, T. Mannseth: *Multi-level parameter structure identification for two-phase porous-media flow problems using flexible parameterizations*, Advances in Water Resources, **32**, 1777-1788, 2009.

S. A. Bakr, T. Mannseth : *Feasibility of simplified integral equation modeling of low-frequency marine CSEM with a resistive target*, Geophysics, **74** (5), 2009.

T. Feng, T. Mannseth : *Improvements on a predictor-corrector strategy for parameter estimation with several data types*, Inverse Problems, **25** (10), 2009.

T. K. Nilssen, K. H. Karlsen, T. Mannseth, X.-C. Tai: *Identification of diffusion parameters in a nonlinear convection-diffusion equation using the augmented Lagrangian method*, Comput. Geosci., **13**, no 3 (2009).

M. Lien, T. Mannseth: *Sensitivity study of marine CSEM data for reservoir production monitoring*, Geophysics, **73** (4), (2008).

M. Lien, D. R. Brouwer, T. Mannseth, J. D. Jansen: *Multiscale regularization of flooding optimization for smart field management,* SPE Journal, **13**, (2008).

I. Berre, M. Lien, T. Mannseth: *A multi-level strategy for regularized parameter identification using nonlinear reparameterization with sample application for reservoir characterization,* Journal of Physics, **135**, Conference Series 2008.

I. Berre, M. Lien, T. Mannseth: *A level set corrector to an adaptive multiscale permeability prediction*, Comput. Geosci., **11**, no 1, (2007).

T. Mannseth: *Analysis and comparison of mixed finite element- and multi point flux approximation methods for homogeneous media*, Comput. Geosci., **11**, no 1, (2007).

L. K. Nielsen, S. Subbey, M. Christie, T. Mannseth: *Reservoir description using dynamic parameterisation selection with a combined stochastic and gradient search*, Comput. Geosci., **10**, no 3, (2006).

M. Ø. Lien, T. Mannseth: *Resolution power of pressure data for permeability identification*, Transport in Porous Media, **64** (2), 2006.

T. Mannseth: *Permeability Identification from Pressure Observations: Some Foundations for Multiscale Regularization*, Multiscale Model. Simul., **5** (1), 2006

M. Lien, I. Berre, T. Mannseth: *Combined adaptive multiscale and level set parameter estimation*, Multiscale Model. Simul., **4** (4), 2005.

H. Kruger, T. Mannseth: *Extension of the parameterization choices in adaptive multiscale estimation*, Inverse Problems in Science and Engineering, **13**, no 5, (2005).

A.-A. Grimstad, T. Mannseth, S. I. Aanonsen, I Aavatsmark, A. Cominelli, S. Mantica: *Identification of unknown permeability trends from history matching of production data,* SPE Journal, **vol. 9**, no. 4 (2004).

H. Kruger, A.-A. Grimstad, T. Mannseth: *Adaptive multiscale estimation of a spatially dependent diffusion function within porous media flow*, Inverse Problems in Engineering, **vol 11**, no 3, (2003).

T. K. Nilssen, T. Mannseth, X.-C. Tai: *Permeability estimation with the augmented Lagrangian method for a nonlinear diffusion equation*, Comput. Geosci., **vol. 7**, no. 1, (2003).

A.-A. Grimstad, T. Mannseth, G. Nævdal, H. Urkedal: *Adaptive multiscale permeability estimation,* Comput. Geosci., **vol. 7**, no. 1, (2003).

A.-A. Grimstad, K. Kolltveit, T. Mannseth, J.-E. Nordtvedt: *Assessing the validity of a linearized accuracy measure for a nonlinear parameter estimation problem*, Inverse Problems, **vol. 17**, no. 5, (2001).

G. Nævdal, E.H. Vefring, A.M. Berg, T. Mannseth, J.-E. Nordtvedt: *A New Methodology for the Optimization of the Placement of Downhole Production-Monitoring Sensors,* SPE Journal, **vol. 6**, no. 1 (2001).

G. Nævdal, T. Mannseth, K Brusdal, J.-E. Nordtvedt: *Multi-scale estimation with spline-wavelets, with application to two-phase porous-media flow*, Inverse Problems, **vol 16**, no. 1, (2000).

A.-A. Grimstad, T. Mannseth: *Nonlinearity, scale, and sensitivity for parameter estimation problems*, SIAM J. Sci. Comput., **vol. 21,** no.6, (2000).

K Brusdal, T. Mannseth: *Basis norm rescaling for nonlinear parameter estimation*, SIAM J. Sci. Comput., **vol. 21,** no.6, (2000)

K. Brusdal, H. K. Dahle, K. Hvistendahl Karlsen, T. Mannseth: *A study of the modeling error in two operator splitting algorithms for porous media flow*, Comput. Geosci., **vol. 2** (1998).

I. Aavatsmark, T. Barkve, Ø. Bøe, T. Mannseth: *Discretization on unstructured grids for inhomogeneous, anisotropic media, Part II: Discussion and numerical results*, SIAM J. Sci. Comput., **vol. 19,** no.5, (1998).

I. Aavatsmark, T. Barkve, Ø. Bøe, T. Mannseth: *Discretization on unstructured grids for inhomogeneous, anisotropic media, Part I: Derivation of the methods*, SIAM J. Sci. Comput., **vol. 19,** no.5, (1998).

I. Aavatsmark, T. Barkve, T. Mannseth: *Control-volume discretization methods for 3D quadrilateral grids in inhomogeneous, anisotropic reservoirs,* SPE Journal, **vol. 3**, no. 2 (1998).

I. Aavatsmark, T. Barkve, Ø. Bøe, T. Mannseth: *Discretization on non-orthogonal, quadrilateral grids for inhomogeneous, anisotropic media*, J. Comput. Phys., **vol 127**, (1996).

I. Aavatsmark, T. Barkve, Ø. Bøe, T. Mannseth: *Discretization on triangular grids for general media*, ZAMM, **vol. 76-suppl. 1**, (1996).

T. Mannseth: *An analysis of the robustness of some incomplete factorizations*, SIAM J. Sci. Comput., **vol. 16,** no.6, (1995).

T. Mannseth: *Commentary on "Origin and quantification of coupling between relative permeabilities for two-phase flows in porous media" by F. Kalaydjian*, Transport in Porous Media, **vol. 6,** (1991).

T. Mannseth: *On the fluid phase momentum balance laws and momentum jump condition for porous media flow*, Europ. J. of Mech., B/Fluids, **vol. 10,** no. 1, (1991).

T. Mannseth, J. N. Tjøtta, S. Tjøtta: *Reflection and refraction of an acoustic beam from water-sediment interface*, Traitement du signal, **vol. 2,** no. 1, (1985).

Conference proceedings publications:

M. Nezhadali, T. Bhakta, K. Fossum, T. Mannseth: *Towards application of multilevel data assimilation in realistic reservoir history-matching problems*, Proc. ECMOR 2022 – European Conference on the Mathematics of Geological Reservoirs, Amsterdam, the Netherlands, September 2022.

T. Bhakta, B. Paap, V. Vandeweijer, T. Mannseth: *Monitoring of CO2 plume movement using time-lapse distributed acoustic sensing (DAS) data*, IMAGE 2022 - International Meeting for Applied Geoscience & Energy, Houston, TX, USA, August/September 2022.

T. Bhakta, M. Lien, T. Mannseth: *Monitoring of CO2 saturation plume movement from time-lapse inverted-seismic and gravity data using an ensemble-based method*, 82nd EAGE Annual Conference & Exhibition, Amsterdam, the Netherlands, October 2021.

M. Nezhadali, T. Bhakta, K. Fossum, T. Mannseth: *A novel approach to multilevel data assimilation*, Proc. ECMOR XVII – 17th European Conference on the Mathematics of Oil Recovery, Edinburgh, Scotland (online event), September 2020.

S.E. Gasda, I. Aavatsmark, B. Bohloli, H. Hellevang, j. Nordbotten, M. Wangen, T. Bjørnarå, W. Boon, H. Fazeli, T. Mannseth, M. Nooraiepour, J. Park, E. Skurtveit, S. Tveit, R. van Noort, J. Varela, S. Thibeau: *Protection of caprock integrity for large-scale CO_2 storage on the Norwegian continental shelf*, Proc. GHGT-14 – 14th International Conference on Greenhouse Gas Control Technologies, Melbourne, Australia, October 2018.

S. Tveit, T. Mannseth: *Identification of geothermal reservoirs from ensemble-based Bayesian inversion of 3D MT data*, expanded abstract in Proc. SEG 88ht International Exposition and Annual Meeting, Anaheim, CA, October 2018.

K. Fossum, T. Mannseth: *A novel multilevel method for assimilating spatially dense data*, Proc. ECMOR XVI – 16th European Conference on the Mathematics of Oil Recovery, Barcelona, Spain, September 2018.

S. Tveit, T. Mannseth, M. Jakobsen: *Discriminating time-lapse saturation and pressure changes in CO_2 monitoring from seismic waveform and CSEM data using ensemble-based Bayesian inversion*, expanded abstract in Proc. SEG 86st International Exposition and Annual Meeting, Dallas, TX, October 18th -21th 2016.

K. Fossum, T. Mannseth: *Large-ensemble data assimilation using an upscaled model*, Proc. ECMOR XV – 15th European Conference on the Mathematics of Oil Recovery, Amsterdam, the Netherlands, August/September 2016.

K. Fossum, T. Mannseth: *Evaluation of ordered sequential assimilation for improved EnKF sampling*, Proc. ECMOR XIV – 14th European Conference on the Mathematics of Oil Recovery, Catania, Italy, September 2014.

S. Tveit, S. A. Bakr, M. Lien, T. Mannseth: *Ensemble-based, Bayesian inversion of CSEM data using structural prior information*, expanded abstract in Proc. 76th EAGE Conference and Exhibition, Amsterdam, The Netherlands, June 17th -19th 2014.

S. A. Bakr, T. Mannseth: *Hybrid method for modeling the CSEM response of a complex geoelectrical subsurface*, expanded abstract in Proc. 76th EAGE Conference and Exhibition, Amsterdam, The Netherlands, June 17th -19th 2014.

T. Gentilhomme, D. Oliver, T. Mannseth, R. Moyen, G. Caumon, P. Doyen: *Adaptive multi-scale ensemble based history matching of seismic-derived models*, Proc. 13th International Congress of the Brazilian Geophysical Society, Rio de Janeiro, Brazil, August 26-29, 2013.

H. K. Hvidevold, G. Alendal, T. Johannessen, T. Mannseth: *Assessing model uncertainties through proper experimental design*, GHGT-11; International Conference on Greenhouse Gas Control, Kyoto, Japan, November 2012.

K. Fossum, T. Mannseth, D. Oliver, H.J. Skaug: *Numerical comparison of Ensemble Kalman Filter and Randomized Maximum Likelihood*, Proc. ECMOR XIII – 13th European Conference on the Mathematics of Oil Recovery, Biarritz, France, September 2012.

T. Gentilhomme, T. Mannseth, D. Oliver, G. Caumon, R. Moyen: *Smooth multi-scale parameterization for integration of seismic and production data using second-generation wavelets*, Proc. ECMOR XIII – 13th European Conference on the Mathematics of Oil Recovery, Biarritz, France, September 2012.

S. A. Bakr, M. Lien, T. Mannseth: *Performance of a Fast Approximate Solver in Identification of Electric Conductivity Changes from Time-lapse CSEM,* expanded abstract in Proc. 74th EAGE Conference and Exhibition, Copenhagen, Denmark, June 4th - 7th 2012.

M. Lien, T. Mannseth: *Structural joint inversion of AVO and CSEM data using flexible representations*, expanded abstract in Proc. SEG 81st International Exposition and Annual Meeting, San Antonio, TX, USA, September 18-23, 2011.

S. A. Bakr, T. Mannseth: *Order-of-magnitude analysis of the range of validity of a low-frequency approximation for CSEM*, expanded abstract in Proc. SEG 81st International Exposition and Annual Meeting, San Antonio, TX, USA, September 18-23, 2011.

I. Berre, M. Lien, T. Mannseth: *Robust inversion of controlled source electromagnetic data for production monitoring*, expanded abstract in Proc. SEG 80th International Exposition and Annual Meeting, Denver, CO, USA, October 17-22, 2010.

T. Feng, T. Mannseth: *Assessing the impact of different types of time-lapse seismic data on permeability estimation*, Proc. ECMOR XII – 12th European Conference on the Mathematics of Oil Recovery, Oxford, UK, September 2010.

A. Kovalenko, T. Mannseth, G. Nævdal: *Error estimate for the ensemble Kalman filter update step*, Proc. ECMOR XII – 12th European Conference on the Mathematics of Oil Recovery, Oxford, UK, September 2010.

S. A. Bakr, T. Mannseth: *Numerical investigation of the range of validity of a low-frequency approximation for CSEM,* expanded abstract in Proc. 72nd EAGE Conference and Exhibition, Barcelona, Spain, June 14th -17th 2010.

S. A. Bakr, T. Mannseth : *Fast 3D modelling of the CSEM response of petroleum reservoirs*, expanded abstract in Proc. SEG 79th International Exposition and Annual Meeting, Houston, TX, USA, October 25-30, 2009.

T. Feng, T. Mannseth, S. I. Aanonsen: *Randomized maximum likelihood with permeability samples generated by a predictor-corrector technique*, SPE 118975, Proc. 2009 SPE Reservoir Simulation Symposium, The Woodlands, TX, February 2009.

A. Fahimuddin, S. I. Aanonsen, T. Mannseth: *Effect of large number of measurements on EnKF model updating*, Proc. ECMOR XI – 11th European Conference on the Mathematics of Oil Recovery, Bergen, Norway, September 2008.

T. Feng, T. Mannseth, S. I. Aanonsen: *Generation of permeability samples for uncertainty assessment by a predictor-corrector technique*, Proc. ECMOR XI – 11th European Conference on the Mathematics of Oil Recovery, Bergen, Norway, September 2008.

I. Berre, F. Clement, M. Lien, T. Mannseth: *Data driven reparameterization structure for estimation of fluid conductivity*. Calibration and reliability in groundwater modelling: credibility of modelling, vol 320. IAHS Publ.; 2008. p 310-315.

M. Lien, T. Mannseth: *Controlled source electromagnetic data for production monitoring – a sensitivity study,* expanded abstract in Proc. SEG 77th International Exposition and Annual Meeting, San Antonio, TX, USA, September 23-28, 2007.

M. Lien, I. Berre, T. Mannseth: *Combined adaptive multiscale and level set parameter estimation*. 3rd International Conference: Inverse Problems; Modeling and Simulation (Extended abstracts), Fethiye, Turkey, May/June 2006.

M. Lien, D. R. Brouwer, T. Mannseth, J. D. Jansen: *Multiscale regularization of flooding optimization for smart field management,* SPE 99728, Proc. of SPE Intelligent Energy Conference and Exhibition, Amsterdam, The Netherlands, April 2006.

A.-A. Grimstad, T. Mannseth: *Comparison of methods for downscaling of coarse scale permeability estimates*, Proc. ECMOR IX – 9th European Conference on the Mathematics of Oil Recovery, Cannes, France, August/September 2004.

A.-A. Grimstad, T. Mannseth, S. I. Aanonsen, I Aavatsmark, A. Cominelli, S. Mantica: *Identification of unknown permeability trends from history matching of production data,* SPE-77485, Proc. of SPE 2002 Annual Technical Conference and Exhibition, San Antonio, TX, USA, September/October 2002.

G. Nævdal, T. Mannseth, E. H. Vefring: *Instrumented wells and near-well reservoir monitoring through ensemble Kalman filter,* presented at ECMOR VIII – 8th European Conference on Mathematics of Oil Recovery, Freiberg, Germany, September 2002.

A.-A. Grimstad, H. Kruger, T. Mannseth, G. Nævdal, H. Urkedal: *Adaptive selection of parameterization for reservoir history matching*, presented at ECMOR VIII – 8th European Conference on Mathematics of Oil Recovery, Freiberg, Germany, September 2002.

A.-A. Grimstad, T. Mannseth: *Adaptive multiscale permeability estimation*, Proc. of 1st International Conference "Inverse Problems: Modeling and Simulation" (Extended abstracts) S. Cohn et al., eds., Fethiye, Turkey, July 2002.

H. Kruger, A.-A. Grimstad, T. Mannseth: *Adaptive multiscale estimation of a spatially dependent diffusion function within porous media flow*, Proc. of 4th International Conference on Inverse Problems in Engineering: Theory and Practice, Angra dos Reis, Brazil, May 2002.

G. Nævdal, T. Mannseth, E. H. Vefring: *Near-well reservoir monitoring through ensemble Kalman filter,* Proc. of SPE/DOE Thirteenth Symposium on Improved Oil Recovery, Tulsa, OK, USA, April 2002.

G. Nævdal, E.H. Vefring, A.M. Berg, T. Mannseth, J.-E. Nordtvedt: *A New Methodology for the Optimization of the Placement of Downhole Production-Monitoring Sensors,* SPE-59301, Proc. of SPE/DOE Improved Oil Recovery Symposium, Tulsa, OK, USA, April 2000.

A.-A. Grimstad, T. Mannseth, G. Nævdal, H. Urkedal: *Scale splitting approach to reservoir characterization,* SPE-66394, Proc. of SPE Reservoir Simulation Symposium, eds. L. Durlofsky et. al., Houston, TX, USA, February 2001.

A.-A. Grimstad, T. Mannseth, J.E. Nordtvedt, G. Nævdal: *Reservoir characterization through scale splitting*, Proc. ECMOR VII – 7th European Conference on the Mathematics of Oil Recovery, Baveno, Italy, September 2000.

T. Mannseth, J. Mykkeltveit, H.A. Friis, M. Haveraaen: *Discretization on non-matching skewed quadrilaterals in anisotropic and heterogeneous porous media*, Proc. ECMOR VII – 7th European Conference on the Mathematics of Oil Recovery, Baveno, Italy, September 2000.

T. Mannseth, J.E. Nordtvedt, G. Nævdal: *Optimal management of advanced wells through fast updates of the near-well reservoir model*, Proc. ECMOR VII – 7th European Conference on the Mathematics of Oil Recovery, Baveno, Italy, September 2000.

A.-A. Grimstad, T. Mannseth, J.E. Nordtvedt, G. Nævdal: *Scale splitting can reduce cost and complexity of reservoir characterization*, Proc. 62nd EAGE Conference & Technical Exhibition (extended abstracts), Glasgow, Scotland, May 2000.

J.-E. Nordtvedt, G. Nævdal, H. Urkedal, A. Berg, T. Mannseth, E. H. Vefring: *Experimental design: Importance in petroleum engineering*, Proc. of 3rd International Conference on Inverse Problems in Engineering: Theory and Practice, Port Ludlow, WA, USA, June 1999.

T. Mannseth, K. Brusdal, A.-A. Grimstad, J.-E. Nordtvedt, G. Nævdal: *Nonlinearity, scale, and sensitivity for parameter estimation problems: Some implications for estimation algorithms*,

Proc. of 3rd International Conference on Inverse Problems in Engineering: Theory and Practice, Port Ludlow, WA, USA, June 1999.

T. Mannseth, A.-A. Grimstad, K. Kolltveit, J.-E. Nordtvedt: *Nonlinearity, scale, and sensitivity for parameter estimation problems: Some implications for error analysis*, Proc. of 3rd International Conference on Inverse Problems in Engineering: Theory and Practice, WA, USA, June 1999.

T. Mannseth: *Prediction uncertainty assessment through scale splitting*, Proc. of EAGE/SPE International Symposium on Petroleum Geostatistics (extended abstracts), Toulouse, France, April 1999.

Mannseth, T., Mykkeltveit J., Nordtvedt J. E., Sylte, A.: *Effects of rock heterogeneities on capillary pressure and relative permeabilities,* Proc. of SPE EUROPEC-98, the Hague, the Netherlands, 1998.

Sylte, A., Mannseth, T., Mykkeltveit J., Nordtvedt J. E.: *Relative permeability and capillary pressure: Effects of rock heterogeneity,* Proc. of Society of Core Analysts 1998 International Symposium, Montpellier, France, 1998.

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