

# Axel Klawonn

## List of Publications by Year in descending order

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105  
papers

2,373  
citations

236612

25  
h-index

223531

46  
g-index

112  
all docs

112  
docs citations

112  
times ranked

629  
citing authors

#	ARTICLE	IF	CITATIONS
1	Adaptive GDSW Coarse Spaces of Reduced Dimension for Overlapping Schwarz Methods. SIAM Journal of Scientific Computing, 2022, 44, A1176-A1204.	1.3	4
2	Energy efficiency of nonlinear domain decomposition methods. International Journal of High Performance Computing Applications, 2021, 35, 237-253.	2.4	2
3	Combining machine learning and domain decomposition methods for the solution of partial differential equations—A review. GAMM Mitteilungen, 2021, 44, e202100001.	2.7	22
4	Topical Issue Scientific Machine Learning (1/2). GAMM Mitteilungen, 2021, 44, .	2.7	2
5	Topical issue scientific machine learning (2/2). GAMM Mitteilungen, 2021, 44, e202100010.	2.7	0
6	Fully-coupled micro–macro finite element simulations of the Nakajima test using parallel computational homogenization. Computational Mechanics, 2021, 68, 1153-1178.	2.2	1
7	Combining Machine Learning and Adaptive Coarse Spaces—A Hybrid Approach for Robust FETI-DP Methods in Three Dimensions. SIAM Journal of Scientific Computing, 2021, 43, S816-S838.	1.3	6
8	Stationary Flow Predictions Using Convolutional Neural Networks. Lecture Notes in Computational Science and Engineering, 2021, , 541-549.	0.1	7
9	Computational homogenization with million-way parallelism using domain decomposition methods. Computational Mechanics, 2020, 65, 1-22.	2.2	15
10	Parallel adaptive FETI–DP using lightweight asynchronous dynamic load balancing. International Journal for Numerical Methods in Engineering, 2020, 121, 621-643.	1.5	6
11	Reduced dimension GDSW coarse spaces for monolithic Schwarz domain decomposition methods for incompressible fluid flow problems. International Journal for Numerical Methods in Engineering, 2020, 121, 1101-1119.	1.5	12
12	EXASTEEL: Towards a Virtual Laboratory for the Multiscale Simulation of Dual-Phase Steel Using High-Performance Computing. Lecture Notes in Computational Science and Engineering, 2020, , 351-404.	0.1	3
13	Local Spectra of Adaptive Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2020, , 167-175.	0.1	2
14	Machine Learning in Adaptive FETI-DP – A Comparison of Smart and Random Training Data. Lecture Notes in Computational Science and Engineering, 2020, , 218-226.	0.1	0
15	A Three-level Extension of the GDSW Overlapping Schwarz Preconditioner in Three Dimensions. Lecture Notes in Computational Science and Engineering, 2020, , 185-192.	0.1	5
16	FROSch: A Fast And Robust Overlapping Schwarz Domain Decomposition Preconditioner Based on Xpetra in Trilinos. Lecture Notes in Computational Science and Engineering, 2020, , 176-184.	0.1	9
17	A Closer Look at Local Eigenvalue Solvers for Adaptive FETI-DP and BDDC. Lecture Notes in Computational Science and Engineering, 2020, , 235-242.	0.1	1
18	Monolithic Overlapping Schwarz Domain Decomposition Methods with GDSW Coarse Spaces for Incompressible Fluid Flow Problems. SIAM Journal of Scientific Computing, 2019, 41, C291-C316.	1.3	12

#	ARTICLE	IF	CITATIONS
19	Comparison of MRI measurements and CFD simulations of hemodynamics in intracranial aneurysms using a 3D printed model – A benchmark problem. Proceedings in Applied Mathematics and Mechanics, 2019, 19, e201900398.	0.2	1
20	Adaptive GDSW Coarse Spaces for Overlapping Schwarz Methods in Three Dimensions. SIAM Journal of Scientific Computing, 2019, 41, A3045-A3072.	1.3	13
21	Machine Learning in Adaptive Domain Decomposition Methods—Predicting the Geometric Location of Constraints. SIAM Journal of Scientific Computing, 2019, 41, A3887-A3912.	1.3	11
22	Comparison of MRI measurements and CFD simulations of hemodynamics in intracranial aneurysms using a 3D printed model – Influence of noisy MRI measurements. Proceedings in Applied Mathematics and Mechanics, 2019, 19, e201900401.	0.2	1
23	A Three-Level Extension of the GDSW Overlapping Schwarz Preconditioner in Two Dimensions. Lecture Notes in Computational Science and Engineering, 2019, , 187-204.	0.1	3
24	Multicore Performance Engineering of Sparse Triangular Solves Using a Modified Roofline Model. , 2018, , .		6
25	Remarks on Fluid–Structure Interaction Simulations in Realistic Arterial Geometries with regard to the Transmural Stress Distribution. Proceedings in Applied Mathematics and Mechanics, 2018, 18, e201800312.	0.2	0
26	An Adaptive GDSW Coarse Space for Two-Level Overlapping Schwarz Methods in Two Dimensions. Lecture Notes in Computational Science and Engineering, 2018, , 373-382.	0.1	3
27	Improving the Parallel Performance of Overlapping Schwarz Methods by Using a Smaller Energy Minimizing Coarse Space. Lecture Notes in Computational Science and Engineering, 2018, , 383-392.	0.1	9
28	Preconditioning of Iterative Eigenvalue Problem Solvers in Adaptive FETI-DP. Lecture Notes in Computational Science and Engineering, 2018, , 415-423.	0.1	1
29	On the Accuracy of the Inner Newton Iteration in Nonlinear Domain Decomposition. Lecture Notes in Computational Science and Engineering, 2018, , 435-443.	0.1	1
30	Using Algebraic Multigrid in Inexact BDDC Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2018, , 425-433.	0.1	1
31	Nonlinear FETI-DP and BDDC Methods: A Unified Framework and Parallel Results. SIAM Journal of Scientific Computing, 2017, 39, C417-C451.	1.3	20
32	Steps Towards More Realistic FSI Simulations of Coronary Arteries. Proceedings in Applied Mathematics and Mechanics, 2017, 17, 187-188.	0.2	0
33	Adaptive Coarse Spaces for FETI-DP in Three Dimensions with Applications to Heterogeneous Diffusion Problems. Lecture Notes in Computational Science and Engineering, 2017, , 187-196.	0.1	2
34	New Nonlinear FETI-DP Methods Based on a Partial Nonlinear Elimination of Variables. Lecture Notes in Computational Science and Engineering, 2017, , 207-215.	0.1	2
35	Parallel Overlapping Schwarz with an Energy-Minimizing Coarse Space. Lecture Notes in Computational Science and Engineering, 2017, , 353-360.	0.1	1
36	Newton-Krylov-FETI-DP with Adaptive Coarse Spaces. Lecture Notes in Computational Science and Engineering, 2017, , 197-205.	0.1	2

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37	A Parallel Implementation of a Two-Level Overlapping Schwarz Method with Energy-Minimizing Coarse Space Based on Trilinos. SIAM Journal of Scientific Computing, 2016, 38, C713-C747.	1.3	27
38	Scalability of Classical Algebraic Multigrid for Elasticity to Half a Million Parallel Tasks. Lecture Notes in Computational Science and Engineering, 2016, , 113-140.	0.1	13
39	Adaptive Coarse Spaces for FETI-DP in Three Dimensions. SIAM Journal of Scientific Computing, 2016, 38, A2880-A2911.	1.3	41
40	Using Local Spectral Information in Domain Decomposition Methods – A Brief Overview in a Nutshell. Proceedings in Applied Mathematics and Mechanics, 2016, 16, 729-730.	0.2	0
41	Numerical modeling of fluid–structure interaction in arteries with anisotropic polyconvex hyperelastic and anisotropic viscoelastic material models at finite strains. International Journal for Numerical Methods in Biomedical Engineering, 2016, 32, e02756.	1.0	36
42	Adaptive Coarse Spaces for BDDC with a Transformation of Basis. Lecture Notes in Computational Science and Engineering, 2016, , 301-309.	0.1	3
43	A Highly Scalable Implementation of Inexact Nonlinear FETI-DP Without Sparse Direct Solvers. Lecture Notes in Computational Science and Engineering, 2016, , 255-264.	0.1	5
44	Parallel Two-Level Overlapping Schwarz Methods in Fluid-Structure Interaction. Lecture Notes in Computational Science and Engineering, 2016, , 521-530.	0.1	4
45	A Nonlinear FETI-DP Method with an Inexact Coarse Problem. Lecture Notes in Computational Science and Engineering, 2016, , 41-52.	0.1	1
46	A Newton-Krylov-FETI-DP Method with an Adaptive Coarse Space Applied to Elastoplasticity. Lecture Notes in Computational Science and Engineering, 2016, , 293-300.	0.1	1
47	Toward Extremely Scalable Nonlinear Domain Decomposition Methods for Elliptic Partial Differential Equations. SIAM Journal of Scientific Computing, 2015, 37, C667-C696.	1.3	47
48	The approximate component mode synthesis special finite element method in two dimensions: Parallel implementation and numerical results. Journal of Computational and Applied Mathematics, 2015, 289, 116-133.	1.1	14
49	FETI-DP Methods with an Adaptive Coarse Space. SIAM Journal on Numerical Analysis, 2015, 53, 297-320.	1.1	57
50	Hybrid MPI/OpenMP Parallelization in FETI-DP Methods. Lecture Notes in Computational Science and Engineering, 2015, , 67-84.	0.1	3
51	On an Adaptive Coarse Space and on Nonlinear Domain Decomposition. Lecture Notes in Computational Science and Engineering, 2014, , 71-83.	0.1	9
52	Nonlinear FETI-DP and BDDC Methods. SIAM Journal of Scientific Computing, 2014, 36, A737-A765.	1.3	40
53	FETI-DP with different scalings for adaptive coarse spaces. Proceedings in Applied Mathematics and Mechanics, 2014, 14, 835-836.	0.2	6
54	Augmented Lagrange methods for quasi–incompressible materials – Applications to soft biological tissue. International Journal for Numerical Methods in Biomedical Engineering, 2013, 29, 332-350.	1.0	14

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55	A Simultaneous Augmented Lagrange Approach for the Simulation of Soft Biological Tissue. Lecture Notes in Computational Science and Engineering, 2013, , 369-376.	0.1	1
56	FETI-DP for Elasticity with Almost Incompressible Material Components. Lecture Notes in Computational Science and Engineering, 2013, , 353-360.	0.1	0
57	Parallel simulation of patient-specific atherosclerotic arteries for the enhancement of intravascular ultrasound diagnostics. Engineering Computations, 2012, 29, 888-906.	0.7	31
58	Analysis of FETI-DP and BDDC for Linear Elasticity in 3D with Almost Incompressible Components and Varying Coefficients Inside Subdomains. SIAM Journal on Numerical Analysis, 2012, 50, 2208-2236.	1.1	16
59	Deflation, Projector Preconditioning, and Balancing in Iterative Substructuring Methods: Connections and New Results. SIAM Journal of Scientific Computing, 2012, 34, A459-A484.	1.3	29
60	Parallel Simulation of Biological Soft Tissue. Proceedings in Applied Mathematics and Mechanics, 2012, 12, 767-768.	0.2	0
61	Projector preconditioning and transformation of basis in FETI-DP algorithms for contact problems. Mathematics and Computers in Simulation, 2012, 82, 1894-1907.	2.4	19
62	FETI-DP domain decomposition methods for elasticity with structural changes:P-elasticity. ESAIM: Mathematical Modelling and Numerical Analysis, 2011, 45, 563-602.	0.8	18
63	On the mechanical modeling of anisotropic biological soft tissue and iterative parallel solution strategies. Archive of Applied Mechanics, 2010, 80, 479-488.	1.2	20
64	Solving geometrically exact micromorphic elasticity with a staggered algorithm. GAMM Mitteilungen, 2010, 33, 57-72.	2.7	2
65	Highly scalable parallel domain decomposition methods with an application to biomechanics. ZAMM Zeitschrift Fur Angewandte Mathematik Und Mechanik, 2010, 90, 5-32.	0.9	95
66	Numerical Simulations of Arterial Walls Based on IVUS-Data. Proceedings in Applied Mathematics and Mechanics, 2009, 9, 75-78.	0.2	2
67	FETI-DP for Anisotropic Problems. Proceedings in Applied Mathematics and Mechanics, 2008, 8, 10189-10190.	0.2	2
68	A hybrid approach to 3-level FETI. Proceedings in Applied Mathematics and Mechanics, 2008, 8, 10841-10843.	0.2	18
69	Spectral element FETI-DP and BDDC preconditioners with multi-element subdomains. Computer Methods in Applied Mechanics and Engineering, 2008, 198, 511-523.	3.4	37
70	Modelling and convergence in arterial wall simulations using a parallel FETI solution strategy. Computer Methods in Biomechanics and Biomedical Engineering, 2008, 11, 569-583.	0.9	43
71	An Analysis of a FETI-DP Algorithm on Irregular Subdomains in the Plane. SIAM Journal on Numerical Analysis, 2008, 46, 2484-2504.	1.1	85
72	Domain Decomposition for Less Regular Subdomains: Overlapping Schwarz in Two Dimensions. SIAM Journal on Numerical Analysis, 2008, 46, 2153-2168.	1.1	73

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73	A Family of Energy Minimizing Coarse Spaces for Overlapping Schwarz Preconditioners. Lecture Notes in Computational Science and Engineering, 2008, , 247-254.	0.1	24
74	MINISYMPOSIUM 5: FETI, Balancing, and Related Hybrid Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2008, , 237-238.	0.1	0
75	Inexact FETI-DP methods. International Journal for Numerical Methods in Engineering, 2007, 69, 284-307.	1.5	64
76	Robust FETI-DP methods for heterogeneous three dimensional elasticity problems. Computer Methods in Applied Mechanics and Engineering, 2007, 196, 1400-1414.	3.4	85
77	Large-scale simulation of arterial walls: mechanical modeling. Proceedings in Applied Mathematics and Mechanics, 2007, 7, 4020017-4020018.	0.2	0
78	Dual-primal Iterative Substructuring for Almost Incompressible Elasticity. , 2007, , 397-404.		6
79	Some Computational Results for Robust FETI-DP Methods Applied to Heterogeneous Elasticity Problems in 3D. , 2007, , 389-396.		0
80	A Parallel Implementation of Dual-Primal FETI Methods for Three-Dimensional Linear Elasticity Using a Transformation of Basis. SIAM Journal of Scientific Computing, 2006, 28, 1886-1906.	1.3	63
81	Dual-primal FETI methods for linear elasticity. Communications on Pure and Applied Mathematics, 2006, 59, 1523-1572.	1.2	153
82	Numerical computation of the porosity of bone substitution materials from synchrotron micro computer tomographic data. Materialwissenschaft Und Werkstofftechnik, 2006, 37, 469-473.	0.5	12
83	FETI Domain Decomposition Methods for Second Order Elliptic Partial Differential Equations. GAMM Mitteilungen, 2006, 29, 319-341.	2.7	11
84	Selecting Constraints in Dual-Primal FETI Methods for Elasticity in Three Dimensions. , 2005, , 67-81.		11
85	Some Computational Results for Dual-Primal FETI Methods for Elliptic Problems in 3D. , 2005, , 361-368.		8
86	A preconditioner for the equations of linear elasticity discretized by the PEERS element. Numerical Linear Algebra With Applications, 2004, 11, 493-510.	0.9	7
87	Dual-Primal FETI Methods for Three-Dimensional Elliptic Problems with Heterogeneous Coefficients. SIAM Journal on Numerical Analysis, 2002, 40, 159-179.	1.1	193
88	Dual-Primal FETI Methods with Face Constraints. Lecture Notes in Computational Science and Engineering, 2002, , 27-40.	0.1	13
89	A FETI Domain Decomposition Method for Edge Element Approximations in Two Dimensions with Discontinuous Coefficients. SIAM Journal on Numerical Analysis, 2001, 39, 932-956.	1.1	30
90	FETI and Neumann-Neumann iterative substructuring methods: Connections and new results. Communications on Pure and Applied Mathematics, 2001, 54, 57-90.	1.2	165

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91	A matrix description for the domain decomposition methods of the FETI family. , 2001, , 1636-1639.		2
92	A comparison of overlapping Schwarz methods and block preconditioners for saddle point problems. Numerical Linear Algebra With Applications, 2000, 7, 1-25.	0.9	44
93	A Domain Decomposition Method with Lagrange Multipliers and Inexact Solvers for Linear Elasticity. SIAM Journal of Scientific Computing, 2000, 22, 1199-1219.	1.3	60
94	Block triangular preconditioners for nonsymmetric saddle point problems: field-of-values analysis. Numerische Mathematik, 1999, 81, 577-594.	0.9	61
95	Overlapping Schwarz methods for mixed linear elasticity and Stokes problems. Computer Methods in Applied Mechanics and Engineering, 1998, 165, 233-245.	3.4	64
96	An Optimal Preconditioner for a Class of Saddle Point Problems with a Penalty Term. SIAM Journal of Scientific Computing, 1998, 19, 540-552.	1.3	86
97	Block-Triangular Preconditioners for Saddle Point Problems with a Penalty Term. SIAM Journal of Scientific Computing, 1998, 19, 172-184.	1.3	126
98	Multiscale coarse spaces for overlapping Schwarz methods based on the ACMS space in 2D. Electronic Transactions on Numerical Analysis, 0, 48, 156-182.	0.0	21
99	Adaptive FETI-DP and BDDC methods with a generalized transformation of basis for heterogeneous problems. Electronic Transactions on Numerical Analysis, 0, 49, 1-27.	0.0	12
100	Nonlinear BDDC Methods with approximate solvers. Electronic Transactions on Numerical Analysis, 0, 49, 244-273.	0.0	8
101	Coarse spaces for FETI-DP and BDDC Methods for heterogeneous problems: connections of deflation and a generalized transformation-of-basis approach. Electronic Transactions on Numerical Analysis, 0, 52, 43-76.	0.0	4
102	A frugal FETI-DP and BDDC coarse space for heterogeneous problems. Electronic Transactions on Numerical Analysis, 0, 53, 562-591.	0.0	6
103	Preconditioning the coarse problem of BDDC methods â€•three-level, algebraic multigrid, and vertex-based preconditioners. Electronic Transactions on Numerical Analysis, 0, 51, 432-450.	0.0	2
104	Estimating the time-dependent contact rate of SIR and SEIR models in mathematical epidemiology using physics-informed neural networks. Electronic Transactions on Numerical Analysis, 0, 56, 1-27.	0.0	4
105	MINISYMPOSIUM 7: FETI and Neumann-Neumann Methods with Primal Constraints. , 0, , 347-347.		0