Axel Klawonn

List of Publications by Year
in descending order

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105	2,373	236612	223531
papers	citations	25 h-index	46 g-index

112	112	112	629
all docs	docs citations	times ranked	citing authors

#	Article	IF	Citations
1	Dual-Primal FETI Methods for Three-Dimensional Elliptic Problems with Heterogeneous Coefficients. SIAM Journal on Numerical Analysis, 2002, 40, 159-179.	1.1	193
2	FETI and Neumann-Neumann iterative substructuring methods: Connections and new results. Communications on Pure and Applied Mathematics, 2001, 54, 57-90.	1.2	165
3	Dual-primal FETI methods for linear elasticity. Communications on Pure and Applied Mathematics, 2006, 59, 1523-1572.	1.2	153
4	Block-Triangular Preconditioners for Saddle Point Problems with a Penalty Term. SIAM Journal of Scientific Computing, 1998, 19, 172-184.	1.3	126
5	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
6	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
7	Robust FETI-DP methods for heterogeneous three dimensional elasticity problems. Computer Methods in Applied Mechanics and Engineering, 2007, 196, 1400-1414.	3.4	85
8	An Analysis of a FETIâ€“DP Algorithm on Irregular Subdomains in the Plane. SIAM Journal on Numerical Analysis, 2008, 46, 2484-2504.	1.1	85
9	Domain Decomposition for Less Regular Subdomains: Overlapping Schwarz in Two Dimensions. SIAM Journal on Numerical Analysis, 2008, 46, 2153-2168.	1.1	73
10	Overlapping Schwarz methods for mixed linear elasticity and Stokes problems. Computer Methods in Applied Mechanics and Engineering, 1998, 165, 233-245.	3.4	64
11	Inexact FETI-DP methods. International Journal for Numerical Methods in Engineering, 2007, 69, 284-307.	1.5	64
12	A Parallel Implementation of Dualâ€Primal FETI Methods for Threeâ€Dimensional Linear Elasticity Using a Transformation of Basis. SIAM Journal of Scientific Computing, 2006, 28, 1886-1906.	1.3	63
13	Block triangular preconditioners for nonsymmetric saddle point problems: field-of-values analysis. Numerische Mathematik, 1999, 81, 577-594.	0.9	61
14	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
15	FETI-DP Methods with an Adaptive Coarse Space. SIAM Journal on Numerical Analysis, 2015, 53, 297-320.	1.1	57
16	Toward Extremely Scalable Nonlinear Domain Decomposition Methods for Elliptic Partial Differential Equations. SIAM Journal of Scientific Computing, 2015, 37, C667-C696.	1.3	47
17	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
18	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

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19	Adaptive Coarse Spaces for FETI-DP in Three Dimensions. SIAM Journal of Scientific Computing, 2016, 38, A2880-A2911.	1.3	41
20	Nonlinear FETI-DP and BDDC Methods. SIAM Journal of Scientific Computing, 2014, 36, A737-A765.	1.3	40
21	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
22	Numerical modeling of fluidâ€“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
23	Parallel simulation of patientâ€specific atherosclerotic arteries for the enhancement of intravascular ultrasound diagnostics. Engineering Computations, 2012, 29, 888-906.	0.7	31
24	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
25	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
26	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
27	A Family of Energy Minimizing Coarse Spaces for Overlapping Schwarz Preconditioners. Lecture Notes in Computational Science and Engineering, 2008, , 247-254.	0.1	24
28	Combining machine learning and domain decomposition methods for the solution of partial differential equationsâ€”A review. GAMM Mitteilungen, 2021, 44, e202100001.	2.7	22
29	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
30	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
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	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
33	A hybrid approach to 3-level FETI. Proceedings in Applied Mathematics and Mechanics, 2008, 8, 10841-10843.	0.2	18
34	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
35	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
36	Computational homogenization with million-way parallelism using domain decomposition methods. Computational Mechanics, 2020, 65, 1-22.	2.2	15

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37	Augmented Lagrange methods for quasiâ€incompressible materialsâ€”Applications to soft biological tissue. International Journal for Numerical Methods in Biomedical Engineering, 2013, 29, 332-350.	1.0	14
38	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
39	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
40	Adaptive GDSW Coarse Spaces for Overlapping Schwarz Methods in Three Dimensions. SIAM Journal of Scientific Computing, 2019, 41, A3045-A3072.	1.3	13
41	Dual-Primal FETI Methods with Face Constraints. Lecture Notes in Computational Science and Engineering, 2002, , 27-40.	0.1	13
42	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
43	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
44	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
45	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
46	Selecting Constraints in Dual-Primal FETI Methods for Elasticity in Three Dimensions. , 2005, , 67-81.		11
47	FETI Domain Decomposition Methods for Second Order Elliptic Partial Differential Equations. GAMM Mitteilungen, 2006, 29, 319-341.	2.7	11
48	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
49	On an Adaptive Coarse Space and on Nonlinear Domain Decomposition. Lecture Notes in Computational Science and Engineering, 2014, , 71-83.	0.1	9
50	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
51	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
52	Some Computational Results for Dual-Primal FETI Methods for Elliptic Problems in 3D. , 2005, , 361-368.		8
53	Nonlinear BDDC Methods with approximate solvers. Electronic Transactions on Numerical Analysis, 0, 49, 244-273.	0.0	8
54	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

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55	Stationary Flow Predictions Using Convolutional Neural Networks. Lecture Notes in Computational Science and Engineering, 2021, , 541-549.	0.1	7
56	FETI-DP with different scalings for adaptive coarse spaces. Proceedings in Applied Mathematics and Mechanics, 2014, 14, 835-836.	0.2	6
57	Multicore Performance Engineering of Sparse Triangular Solves Using a Modified Roofline Model. , 2018, , .		6
58	Parallel adaptive FETIâ€DP using lightweight asynchronous dynamic load balancing. International Journal for Numerical Methods in Engineering, 2020, 121, 621-643.	1.5	6
59	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
60	Dual-primal Iterative Substructuring for Almost Incompressible Elasticity. , 2007, , 397-404.		6
61	A frugal FETI-DP and BDDC coarse space for heterogeneous problems. Electronic Transactions on Numerical Analysis, 0, 53, 562-591.	0.0	6
62	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
63	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
64	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
65	Parallel Two-Level Overlapping Schwarz Methods in Fluid-Structure Interaction. Lecture Notes in Computational Science and Engineering, 2016, , 521-530.	0.1	4
66	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
67	Adaptive GDSW Coarse Spaces of Reduced Dimension for Overlapping Schwarz Methods. SIAM Journal of Scientific Computing, 2022, 44, A1176-A1204.	1.3	4
68	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
69	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
70	Adaptive Coarse Spaces for BDDC with a Transformation of Basis. Lecture Notes in Computational Science and Engineering, 2016, , 301-309.	0.1	3
71	Hybrid MPI/OpenMP Parallelization in FETI-DP Methods. Lecture Notes in Computational Science and Engineering, 2015, , 67-84.	0.1	3
72	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

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73	FETIâ€ÐP for Anisotropic Problems. Proceedings in Applied Mathematics and Mechanics, 2008, 8, 10189-10190.	0.2	2
74	Numerical Simulations of Arterial Walls Based on IVUS-Data. Proceedings in Applied Mathematics and Mechanics, 2009, 9, 75-78.	0.2	2
75	Solving geometrically exact micromorphic elasticity with a staggered algorithm. GAMM Mitteilungen, 2010, 33, 57-72.	2.7	2
76	Energy efficiency of nonlinear domain decomposition methods. International Journal of High Performance Computing Applications, 2021, 35, 237-253.	2.4	2
77	Topical Issue Scientific Machine Learning (1/2). GAMM Mitteilungen, 2021, 44, .	2.7	2
78	Local Spectra of Adaptive Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2020, , 167-175.	0.1	2
79	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
80	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
81	A matrix description for the domain decomposition methods of the FETI family. , 2001, , 1636-1639.		2
82	Newton-Krylov-FETI-DP with Adaptive Coarse Spaces. Lecture Notes in Computational Science and Engineering, 2017, , 197-205.	0.1	2
83	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
84	Comparison of MRI measurements and CFD simulations of hemodynamics in intracranial aneurysms using a 3D printed model â€•A benchmark problem. Proceedings in Applied Mathematics and Mechanics, 2019, 19, e201900398.	0.2	1
85	Comparison of MRI measurements and CFD simulations of hemodynamics in intracranial aneurysms using a 3D printed model â€•Influence of noisy MRI measurements. Proceedings in Applied Mathematics and Mechanics, 2019, 19, e201900401.	0.2	1
86	Fully-coupled microâ€“macro finite element simulations of the Nakajima test using parallel computational homogenization. Computational Mechanics, 2021, 68, 1153-1178.	2.2	1
87	Preconditioning of Iterative Eigenvalue Problem Solvers in Adaptive FETI-DP. Lecture Notes in Computational Science and Engineering, 2018, , 415-423.	0.1	1
88	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
89	A Nonlinear FETI-DP Method with an Inexact Coarse Problem. Lecture Notes in Computational Science and Engineering, 2016, , 41-52.	0.1	1
90	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

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91	Parallel Overlapping Schwarz with an Energy-Minimizing Coarse Space. Lecture Notes in Computational Science and Engineering, 2017, , 353-360.	0.1	1
92	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
93	Using Algebraic Multigrid in Inexact BDDC Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2018, , 425-433.	0.1	1
94	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
95	Large-scale simulation of arterial walls: mechanical modeling. Proceedings in Applied Mathematics and Mechanics, 2007, 7, 4020017-4020018.	0.2	0
96	Parallel Simulation of Biological Soft Tissue. Proceedings in Applied Mathematics and Mechanics, 2012, 12, 767-768.	0.2	0
97	Using Local Spectral Information in Domain Decomposition Methods â€“ A Brief Overview in a Nutshell. Proceedings in Applied Mathematics and Mechanics, 2016, 16, 729-730.	0.2	0
98	Steps Towards More Realistic FSI Simulations of Coronary Arteries. Proceedings in Applied Mathematics and Mechanics, 2017, 17, 187-188.	0.2	0
99	Remarks on Fluidâ€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
100	Topical issue scientific machine learning (2/2). GAMM Mitteilungen, 2021, 44, e202100010.	2.7	0
101	MINISYMPOSIUM 5: FETI, Balancing, and Related Hybrid Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2008, , 237-238.	0.1	0
102	FETI-DP for Elasticity with Almost Incompressible Material Components. Lecture Notes in Computational Science and Engineering, 2013, , 353-360.	0.1	0
103	Machine Learning in Adaptive FETI-DP â€“ A Comparison of Smart and Random Training Data. Lecture Notes in Computational Science and Engineering, 2020, , 218-226.	0.1	0
104	Some Computational Results for Robust FETI-DP Methods Applied to Heterogeneous Elasticity Problems in 3D. , 2007, , 389-396.		0
105	MINISYMPOSIUM 7: FETI and Neumann-Neumann Methods with Primal Constraints. , 0, , 347-347.		0