Peter DÃ¼ben

List of Publications by Year
in descending order

60 papers	1,974 citations	331538 21 h-index	276775 41 g-index
84 all docs	84 docs citations	84 times ranked	1850 citing authors

#	Article	IF	Citations
1	DYAMOND: the DYnamics of the Atmospheric general circulation Modeled On Non-hydrostatic Domains. Progress in Earth and Planetary Science, 2019, 6, .	1.1	239
2	Challenges and design choices for global weather and climate models based on machine learning. Geoscientific Model Development, 2018, 11, 3999-4009.	1.3	179
3	Global Cloud-Resolving Models. Current Climate Change Reports, 2019, 5, 172-184.	2.8	164
4	WeatherBench: A Benchmark Data Set for Dataâ€Driven Weather Forecasting. Journal of Advances in Modeling Earth Systems, 2020, 12, e2020MS002203.	1.3	150
5	The digital revolution of Earth-system science. Nature Computational Science, 2021, 1, 104-113.	3.8	98
6	Single Precision in Weather Forecasting Models: An Evaluation with the IFS. Monthly Weather Review, 2017, 145, 495-502.	0.5	75
7	Deep learning for post-processing ensemble weather forecasts. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2021, 379, 20200092.	1.6	60
8	Opportunities and challenges for machine learning in weather and climate modelling: hard, medium and soft AI. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2021, 379, 20200083.	1.6	55
9	A Baseline for Global Weather and Climate Simulations at 1 km Resolution. Journal of Advances in Modeling Earth Systems, 2020, 12, e2020MS002192.	1.3	54
10	Benchmark Tests for Numerical Weather Forecasts on Inexact Hardware. Monthly Weather Review, 2014, 142, 3809-3829.	0.5	50
11	The use of imprecise processing to improve accuracy in weather & climate prediction. Journal of Computational Physics, 2014, 271, 2-18.	1.9	48
12	Assessing the scales in numerical weather and climate predictions: will exascale be the rescue?. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2019, 377, 20180148.	1.6	48
13	Bridging observations, theory and numerical simulation of the ocean using machine learning. Environmental Research Letters, 2021, 16, 073008.	2.2	40
14	rpe v5: an emulator for reduced floating-point precision in large numerical simulations. Geoscientific Model Development, 2017, 10, 2221-2230.	1.3	39
15	TRU-NET: a deep learning approach to high resolution prediction of rainfall. Machine Learning, 2021, 110, 2035-2062.	3.4	33
16	Machine Learning Emulation of Gravity Wave Drag in Numerical Weather Forecasting. Journal of Advances in Modeling Earth Systems, 2021, 13, e2021MS002477.	1.3	33
17	On the use of programmable hardware and reduced numerical precision in earthâ€system modeling. Journal of Advances in Modeling Earth Systems, 2015, 7, 1393-1408.	1.3	29
18	On the use of scaleâ€dependent precision in Earth System modelling. Quarterly Journal of the Royal Meteorological Society, 2017, 143, 897-908.	1.0	28

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19	Tropical Cyclones in Global Storm-Resolving Models. Journal of the Meteorological Society of Japan, 2021, 99, 579-602.	0.7	28
20	Global Simulations of the Atmosphere at 1.45 km Grid-Spacing with the Integrated Forecasting System. Journal of the Meteorological Society of Japan, 2020, 98, 551-572.	0.7	27
21	On the use of inexact, pruned hardware in atmospheric modelling. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2014, 372, 20130276.	1.6	25
22	Improving Weather Forecast Skill through Reduced-Precision Data Assimilation. Monthly Weather Review, 2018, 146, 49-62.	0.5	24
23	Number Formats, Error Mitigation, and Scope for 16â€Bit Arithmetics in Weather and Climate Modeling Analyzed With a Shallow Water Model. Journal of Advances in Modeling Earth Systems, 2020, 12, e2020MS002246.	1.3	24
24	Systematic detection of local CH₄ anomalies by combining satellite measurements with high-resolution forecasts. Atmospheric Chemistry and Physics, 2021, 21, 5117-5136.	1.9	24
25	Posits as an alternative to floats for weather and climate models. , 2019, , .		23
26	Opportunities for Energy Efficient Computing: A Study of Inexact General Purpose Processors for High-Performance and Big-Data Applications. , 2015, , .		22
27	Scale-Selective Precision for Weather and Climate Forecasting. Monthly Weather Review, 2019, 147, 645-655.	0.5	22
28	Building Tangentâ€Linear and Adjoint Models for Data Assimilation With Neural Networks. Journal of Advances in Modeling Earth Systems, 2021, 13, e2021MS002521.	1.3	22
29	Accelerating High-Resolution Weather Models with Deep-Learning Hardware. , 2019, , .		20
30	Reliable low precision simulations in land surface models. Climate Dynamics, 2018, 51, 2657-2666.	1.7	18
31	Choosing the Optimal Numerical Precision for Data Assimilation in the Presence of Model Error. Journal of Advances in Modeling Earth Systems, 2018, 10, 2177-2191.	1.3	18
32	Machine Learning for Earth System Observation and Prediction. Bulletin of the American Meteorological Society, 2021, 102, E710-E716.	1.7	18
33	A study of reduced numerical precision to make superparameterization more competitive using a hardware emulator in the OpenIFS model. Journal of Advances in Modeling Earth Systems, 2017, 9, 566-584.	1.3	16
34	Model intercomparison of COSMO 5.0 and IFS 45r1 at kilometer-scale grid spacing. Geoscientific Model Development, 2021, 14, 4617-4639.	1.3	15
35	More accuracy with less precision. Quarterly Journal of the Royal Meteorological Society, 2021, 147, 4358-4370.	1.0	13
36	Machine Learning Emulation of 3D Cloud Radiative Effects. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	12

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37	Compressing atmospheric data into its real information content. Nature Computational Science, 2021, 1, 713-724.	3.8	12
38	A discontinuous/continuous low order finite element shallow water model on the sphere. Journal of Computational Physics, 2012, 231, 2396-2413.	1.9	11
39	Monte Carlo simulations of the randomly forced Burgers equation. Europhysics Letters, 2008, 84, 40002.	0.7	10
40	Exploiting the chaotic behaviour of atmospheric models with reconfigurable architectures. Computer Physics Communications, 2017, 221, 160-173.	3.0	10
41	Stochastic modelling and energy-efficient computing for weather and climate prediction. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2014, 372, 20140118.	1.6	9
42	Bitwise efficiency in chaotic models. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2017, 473, 20170144.	1.0	9
43	A Comparison of Dataâ€Driven Approaches to Build Lowâ€Dimensional Ocean Models. Journal of Advances in Modeling Earth Systems, 2021, 13, e2021MS002537.	1.3	9
44	Rounding errors may be beneficial for simulations of atmospheric flow: results from the forced 1D Burgers equation. Theoretical and Computational Fluid Dynamics, 2015, 29, 311-328.	0.9	8
45	Fluid Simulations Accelerated With 16 Bits: Approaching 4x Speedup on A64FX by Squeezing ShallowWaters.jl Into Float16. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	8
46	Atmosphere and Ocean Modeling on Grids of Variable Resolutionâ€"A 2D Case Study. Monthly Weather Review, 2014, 142, 1997-2017.	0.5	7
47	A power law for reduced precision at small spatial scales: Experiments with an SQG model. Quarterly Journal of the Royal Meteorological Society, 2018, 144, 1179-1188.	1.0	7
48	Resilience and fault tolerance in high-performance computing for numerical weather and climate prediction. International Journal of High Performance Computing Applications, 2021, 35, 285-311.	2.4	7
49	Architectures and Precision Analysis for Modelling Atmospheric Variables with Chaotic Behaviour. , 2015, , .		6
50	Reducedâ€precision parametrization: lessons from an intermediateâ€complexity atmospheric model. Quarterly Journal of the Royal Meteorological Society, 2020, 146, 1590-1607.	1.0	6
51	Deep Learning to Estimate Model Biases in an Operational NWP Assimilation System. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	6
52	Lower precision for higher accuracy: Precision and resolution exploration for shallow water equations. , 2015, , .		5
53	An approach to secure weather and climate models against hardware faults. Journal of Advances in Modeling Earth Systems, 2017, 9, 501-513.	1.3	4
54	A Stochastic Representation of Subgrid Uncertainty for Dynamical Core Development. Bulletin of the American Meteorological Society, 2019, 100, 1091-1101.	1.7	4

#	Article	IF	Citations
55	Single-Precision in the Tangent-Linear and Adjoint Models of Incremental 4D-Var. Monthly Weather Review, 2020, 148, 1541-1552.	0.5	4
56	Machine Learning Emulation of Urban Land Surface Processes. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	4
57	A New Number Format for Ensemble Simulations. Journal of Advances in Modeling Earth Systems, 2018, 10, 2983-2991.	1.3	3
58	The Relationship between Numerical Precision and Forecast Lead Time in the Lorenzâ€™95 System. Monthly Weather Review, 2020, 148, 849-855.	0.5	2
59	Validating optimisations for chaotic simulations. , 2017, , .		1
60	New Methods for Data Storage of Model Output from Ensemble Simulations. Monthly Weather Review, 2019, 147, 677-689.	0.5	1