Peter DÃ¼ben

List of Publications by Year
in descending order

#	Article	IF	Citations
1	Machine Learning Emulation of 3D Cloud Radiative Effects. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	12
2	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
3	Machine Learning Emulation of Urban Land Surface Processes. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	4
4	Deep Learning to Estimate Model Biases in an Operational NWP Assimilation System. Journal of Advances in Modeling Earth Systems, 2022, 14, .	1.3	6
5	The digital revolution of Earth-system science. Nature Computational Science, 2021, 1, 104-113.	3.8	98
6	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
7	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
8	Deep learning for post-processing ensemble weather forecasts. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2021, 379, 20200092.	1.6	60
9	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
10	Machine Learning for Earth System Observation and Prediction. Bulletin of the American Meteorological Society, 2021, 102, E710-E716.	1.7	18
11	TRU-NET: a deep learning approach to high resolution prediction of rainfall. Machine Learning, 2021, 110, 2035-2062.	3.4	33
12	Bridging observations, theory and numerical simulation of the ocean using machine learning. Environmental Research Letters, 2021, 16, 073008.	2.2	40
13	Machine Learning Emulation of Gravity Wave Drag in Numerical Weather Forecasting. Journal of Advances in Modeling Earth Systems, 2021, 13, e2021MS002477.	1.3	33
14	Model intercomparison of COSMO 5.0 and IFS 45r1 at kilometer-scale grid spacing. Geoscientific Model Development, 2021, 14, 4617-4639.	1.3	15
15	A Comparison of Dataâ€Ðriven Approaches to Build Lowâ€Ðimensional Ocean Models. Journal of Advances in Modeling Earth Systems, 2021, 13, e2021MS002537.	1.3	9
16	Building Tangentâ€Łinear and Adjoint Models for Data Assimilation With Neural Networks. Journal of Advances in Modeling Earth Systems, 2021, 13, e2021MS002521.	1.3	22
17	Tropical Cyclones in Global Storm-Resolving Models. Journal of the Meteorological Society of Japan, 2021, 99, 579-602.	0.7	28
18	More accuracy with less precision. Quarterly Journal of the Royal Meteorological Society, 2021, 147, 4358-4370.	1.0	13

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19	Compressing atmospheric data into its real information content. Nature Computational Science, 2021, 1, 713-724.	3.8	12
20	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
21	WeatherBench: A Benchmark Data Set for Dataâ€Driven Weather Forecasting. Journal of Advances in Modeling Earth Systems, 2020, 12, e2020MS002203.	1.3	150
22	The Relationship between Numerical Precision and Forecast Lead Time in the Lorenzâ€™95 System. Monthly Weather Review, 2020, 148, 849-855.	0.5	2
23	Reducedâ€precision parametrization: lessons from an intermediateâ€complexity atmospheric model. Quarterly Journal of the Royal Meteorological Society, 2020, 146, 1590-1607.	1.0	6
24	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
25	Single-Precision in the Tangent-Linear and Adjoint Models of Incremental 4D-Var. Monthly Weather Review, 2020, 148, 1541-1552.	0.5	4
26	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
27	Posits as an alternative to floats for weather and climate models. , 2019, , .		23
28	Accelerating High-Resolution Weather Models with Deep-Learning Hardware. , 2019, , .		20
29	Global Cloud-Resolving Models. Current Climate Change Reports, 2019, 5, 172-184.	2.8	164
30	New Methods for Data Storage of Model Output from Ensemble Simulations. Monthly Weather Review, 2019, 147, 677-689.	0.5	1
31	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
32	A Stochastic Representation of Subgrid Uncertainty for Dynamical Core Development. Bulletin of the American Meteorological Society, 2019, 100, 1091-1101.	1.7	4
33	Scale-Selective Precision for Weather and Climate Forecasting. Monthly Weather Review, 2019, 147, 645-655.	0.5	22
34	DYAMOND: the DYnamics of the Atmospheric general circulation Modeled On Non-hydrostatic Domains. Progress in Earth and Planetary Science, 2019, 6, .	1.1	239
35	Reliable low precision simulations in land surface models. Climate Dynamics, 2018, 51, 2657-2666.	1.7	18
36	Improving Weather Forecast Skill through Reduced-Precision Data Assimilation. Monthly Weather Review, 2018, 146, 49-62.	0.5	24

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37	A New Number Format for Ensemble Simulations. Journal of Advances in Modeling Earth Systems, 2018, 10, 2983-2991.	1.3	3
38	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
39	Challenges and design choices for global weather and climate models based on machine learning. Geoscientific Model Development, 2018, 11, 3999-4009.	1.3	179
40	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
41	Single Precision in Weather Forecasting Models: An Evaluation with the IFS. Monthly Weather Review, 2017, 145, 495-502.	0.5	75
42	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
43	Bitwise efficiency in chaotic models. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2017, 473, 20170144.	1.0	9
44	Exploiting the chaotic behaviour of atmospheric models with reconfigurable architectures. Computer Physics Communications, 2017, 221, 160-173.	3.0	10
45	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
46	Validating optimisations for chaotic simulations. , 2017, , .		1
47	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
48	rpe v5: an emulator for reduced floating-point precision in large numerical simulations. Geoscientific Model Development, 2017, 10, 2221-2230.	1.3	39
49	Architectures and Precision Analysis for Modelling Atmospheric Variables with Chaotic Behaviour. , 2015, , .		6
50	Opportunities for Energy Efficient Computing: A Study of Inexact General Purpose Processors for High-Performance and Big-Data Applications. , 2015, , .		22
51	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
52	Lower precision for higher accuracy: Precision and resolution exploration for shallow water equations. , 2015, , .		5
53	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
54	Benchmark Tests for Numerical Weather Forecasts on Inexact Hardware. Monthly Weather Review, 2014, 142, 3809-3829.	0.5	50

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55	Atmosphere and Ocean Modeling on Grids of Variable Resolutionâ€”A 2D Case Study. Monthly Weather Review, 2014, 142, 1997-2017.	0.5	7
56	The use of imprecise processing to improve accuracy in weather & climate prediction. Journal of Computational Physics, 2014, 271, 2-18.	1.9	48
57	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
58	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
59	A discontinuous/continuous low order finite element shallow water model on the sphere. Journal of Computational Physics, 2012, 231, 2396-2413.	1.9	11
60	Monte Carlo simulations of the randomly forced Burgers equation. Europhysics Letters, 2008, 84, 40002.	0.7	10