Mathias Rotach

List of Publications by Year
in descending order

123 papers	7,731 citations	53794 45 h-index	54911 84 g-index
160 all docs	160 docs citations	160 times ranked	6295 citing authors

#	Article	IF	Citations
1	An Urban Surface Exchange Parameterisation for Mesoscale Models. Boundary-Layer Meteorology, 2002, 104, 261-304.	2.3	852
2	A Simple Parameterisation for Flux Footprint Predictions. Boundary-Layer Meteorology, 2004, 112, 503-523.	2.3	611
3	A simple two-dimensional parameterisation for Flux Footprint Prediction (FFP). Geoscientific Model Development, 2015, 8, 3695-3713.	3.6	579
4	BUBBLE â€" an Urban Boundary Layer Meteorology Project. Theoretical and Applied Climatology, 2005, 81, 231-261.	2.8	326
5	A Three-Dimensional Backward Lagrangian Footprint Model For A Wide Range Of Boundary-Layer Stratifications. Boundary-Layer Meteorology, 2002, 103, 205-226.	2.3	224
6	Profiles of turbulence statistics in and above an urban street canyon. Atmospheric Environment, 1995, 29, 1473-1486.	4.1	197
7	Mean Flow and Turbulence Characteristics in an Urban Roughness Sublayer. Boundary-Layer Meteorology, 2004, 111, 55-84.	2.3	197
8	RESEARCH CAMPAIGN: The Convective and Orographically Induced Precipitation Study. Bulletin of the American Meteorological Society, 2008, 89, 1477-1486.	3.3	194
9	The Convective and Orographicallyâ€induced Precipitation Study (COPS): the scientific strategy, the field phase, and research highlights. Quarterly Journal of the Royal Meteorological Society, 2011, 137, 3-30.	2.7	181
10	A wind tunnel study of organised and turbulent air motions in urban street canyons. Journal of Wind Engineering and Industrial Aerodynamics, 2001, 89, 849-861.	3.9	179
11	On the boundary-layer structure over highly complex terrain: Key findings from MAP. Quarterly Journal of the Royal Meteorological Society, 2007, 133, 937-948.	2.7	156
12	High-Resolution Large-Eddy Simulations of Flow in a Steep Alpine Valley. Part I: Methodology, Verification, and Sensitivity Experiments. Journal of Applied Meteorology and Climatology, 2006, 45, 63-86.	1.5	153
13	Turbulence close to a rough urban surface part I: Reynolds stress. Boundary-Layer Meteorology, 1993, 65, 1-28.	2.3	147
14	On the influence of the urban roughness sublayer on turbulence and dispersion. Atmospheric Environment, 1999, 33, 4001-4008.	4.1	140
15	Exchange Processes in the Atmospheric Boundary Layer Over Mountainous Terrain. Atmosphere, 2018, 9, 102.	2.3	131
16	MAP D-PHASE: Real-Time Demonstration of Weather Forecast Quality in the Alpine Region. Bulletin of the American Meteorological Society, 2009, 90, 1321-1336.	3.3	121
17	Temporal dynamics of CO2 fluxes and profiles over a Central European city. Theoretical and Applied Climatology, 2006, 84, 117-126.	2.8	119
18	Assessing the Benefits of Convection-Permitting Models by Neighborhood Verification: Examples from MAP D-PHASE. Monthly Weather Review, 2010, 138, 3418-3433.	1.4	113

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19	The Nature, Theory, and Modeling of Atmospheric Planetary Boundary Layers. Bulletin of the American Meteorological Society, 2011, 92, 123-128.	3.3	103
20	MAP Dâ€PHASE: realâ€time demonstration of hydrological ensemble prediction systems. Atmospheric Science Letters, 2008, 9, 80-87.	1.9	102
21	On the Measurement of Turbulence Over Complex Mountainous Terrain. Boundary-Layer Meteorology, 2016, 159, 97-121.	2.3	87
22	Impact of Climate Change on Voltinism and Prospective Diapause Induction of a Global Pest Insect â€" Cydia pomonella (L.). PLoS ONE, 2012, 7, e35723.	2.5	85
23	A two-dimensional Lagrangian stochastic dispersion model for daytime conditions. Quarterly Journal of the Royal Meteorological Society, 1996, 122, 367-389.	2.7	84
24	Turbulence close to a rough urban surface part II: Variances and gradients. Boundary-Layer Meteorology, 1993, 66, 75-92.	2.3	82
25	Surface radiation budget in an Alpine valley. Quarterly Journal of the Royal Meteorological Society, 2003, 129, 877-895.	2.7	79
26	On the turbulence structure in the stable boundary layer over the Greenland ice sheet. Boundary-Layer Meteorology, 1997, 85, 111-136.	2.3	78
27	On the impact of urban surface exchange parameterisations on air quality simulations: the Athens case. Atmospheric Environment, 2003, 37, 4217-4231.	4.1	78
28	Turbulence Structure and Exchange Processes in an Alpine Valley: The Riviera Project. Bulletin of the American Meteorological Society, 2004, 85, 1367-1386.	3.3	76
29	High-Resolution Large-Eddy Simulations of Flow in a Steep Alpine Valley. Part II: Flow Structure and Heat Budgets. Journal of Applied Meteorology and Climatology, 2006, 45, 87-107.	1.5	70
30	Current Challenges in Understanding and Predicting Transport and Exchange in the Atmosphere over Mountainous Terrain. Atmosphere, 2018, 9, 276.	2.3	67
31	Flow structure and turbulence characteristics of the daytime atmosphere in a steep and narrow Alpine valley. Quarterly Journal of the Royal Meteorological Society, 2004, 130, 2605-2627.	2.7	66
32	The Budget of Turbulent Kinetic Energy in the Urban Roughness Sublayer. Boundary-Layer Meteorology, 2009, 131, 193-222.	2.3	65
33	A novel approach to atmospheric dispersion modelling: The Puff-Particle Model. Quarterly Journal of the Royal Meteorological Society, 1998, 124, 2771-2792.	2.7	64
34	Comparison of the Langrangian Footprint. Boundary-Layer Meteorology, 2003, 106, 349-355.	2.3	64
35	The World is Not Flat: Implications for the Global Carbon Balance. Bulletin of the American Meteorological Society, 2014, 95, 1021-1028.	3.3	60
36	Simulation Of Urban-Scale Dispersion Using A Lagrangian Stochastic Dispersion Model. Boundary-Layer Meteorology, 2001, 99, 379-410.	2.3	57

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37	Pollutant dispersion close to an urban surface ? the BUBBLE tracer experiment. Meteorology and Atmospheric Physics, 2004, 87, 39.	2.0	57
38	Boundary layer characteristics and turbulent exchange mechanisms in highly complex terrain. Acta Geophysica, 2008, 56, 194-219.	2.0	55
39	Cool city mornings by urban heat. Environmental Research Letters, 2015, 10, 114022.	5.2	55
40	The impact of valley geometry on daytime thermally driven flows and vertical transport processes. Quarterly Journal of the Royal Meteorological Society, 2015, 141, 1780-1794.	2.7	54
41	Investigating the Surface Energy Balance in Urban Areas â€“ Recent Advances and Future Needs. Water, Air and Soil Pollution, 2002, 2, 1-16.	0.8	51
42	Evaluation of Lagrangian footprint model using data from wind tunnel convective boundary layer. Agricultural and Forest Meteorology, 2004, 127, 189-201.	4.8	51
43	The Impact of Three-Dimensional Effects on the Simulation of Turbulence Kinetic Energy in a Major Alpine Valley. Boundary-Layer Meteorology, 2018, 168, 1-27.	2.3	51
44	The effect of mountainous topography on moisture exchange between the â€œsurfaceâ€•and the free atmosphere. Boundary-Layer Meteorology, 2007, 125, 227-244.	2.3	49
45	Investigating Exchange Processes over Complex Topography: The Innsbruck Box (i-Box). Bulletin of the American Meteorological Society, 2017, 98, 787-805.	3.3	49
46	On the Vertical Exchange of Heat, Mass, and Momentum Over Complex, Mountainous Terrain. Frontiers in Earth Science, 0, 3, .	1.8	48
47	Determination of the zero plane displacement in an urban environment. Boundary-Layer Meteorology, 1994, 67, 187-193.	2.3	47
48	The Impact of Horizontal Model Grid Resolution on the Boundary Layer Structure over an Idealized Valley. Monthly Weather Review, 2014, 142, 3446-3465.	1.4	46
49	Reasons for the Extremely High-Ranging Planetary Boundary Layer over the Western Tibetan Plateau in Winter. Journals of the Atmospheric Sciences, 2016, 73, 2021-2038.	1.7	45
50	On the nature of turbulent kinetic energy in a steep and narrow Alpine valley. Boundary-Layer Meteorology, 2007, 123, 177-199.	2.3	43
51	EMPOL 1.0: a new parameterization of pollen emission in numerical weather prediction models. Geoscientific Model Development, 2013, 6, 1961-1975.	3.6	43
52	Downscaling climate change scenarios for apple pest and disease modeling in Switzerland. Earth System Dynamics, 2012, 3, 33-47.	7.1	41
53	A method to derive vegetation distribution maps for pollen dispersion models using birch as an example. International Journal of Biometeorology, 2012, 56, 949-958.	3.0	41
54	Atmospheric Pollutant Dispersion over Complex Terrain: Challenges and Needs for Improving Air Quality Measurements and Modeling. Atmosphere, 2020, 11, 646.	2.3	41

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55	The performance of RAMS in representing the convective boundary layer structure in a very steep valley. Environmental Fluid Mechanics, 2005, 5, 35-62.	1.6	40
56	Meteorology applied to urban air pollution problems: concepts from COST 715. Atmospheric Chemistry and Physics, 2006, 6, 555-564.	4.9	40
57	Developing a Research Strategy to Better Understand, Observe, and Simulate Urban Atmospheric Processes at Kilometer to Subkilometer Scales. Bulletin of the American Meteorological Society, 2017, 98, ES261-ES264.	3.3	40
58	Evaluation of the COSMO-SC turbulence scheme in a shear-driven stable boundary layer. Meteorologische Zeitschrift, 2011, 20, 335-350.	1.0	37
59	Nested regional simulation of climate change over the Alps for the scenario of a doubled greenhouse forcing. Theoretical and Applied Climatology, 1997, 57, 209-227.	2.8	35
60	Scaling, Anisotropy, and Complexity in Nearâ€Surface Atmospheric Turbulence. Journal of Geophysical Research D: Atmospheres, 2019, 124, 1428-1448.	3.3	33
61	Scalar-Flux Similarity in the Layer Near the Surface Over Mountainous Terrain. Boundary-Layer Meteorology, 2018, 169, 11-46.	2.3	32
62	The Impact of the Temperature Inversion Breakup on the Exchange of Heat and Mass in an Idealized Valley: Sensitivity to the Radiative Forcing. Journal of Applied Meteorology and Climatology, 2015, 54, 2199-2216.	1.5	31
63	Horizontal Variability of 2-m Temperature at Night during CASES-97. Journals of the Atmospheric Sciences, 2003, 60, 2431-2449.	1.7	30
64	Numerical ragweed pollen forecasts using different source maps: a comparison for France. International Journal of Biometeorology, 2017, 61, 23-33.	3.0	28
65	Accuracy of retrieving temperature and humidity profiles by ground-based microwave radiometry in truly complex terrain. Atmospheric Measurement Techniques, 2015, 8, 3355-3367.	3.1	27
66	Evaluation of local similarity theory in the wintertime nocturnal boundary layer over heterogeneous surface. Agricultural and Forest Meteorology, 2016, 228-229, 164-179.	4.8	27
67	Quantifying horizontal and vertical tracer mass fluxes in an idealized valley during daytime. Atmospheric Chemistry and Physics, 2016, 16, 13049-13066.	4.9	27
68	Influence of along-valley terrain heterogeneity on exchange processes over idealized valleys. Atmospheric Chemistry and Physics, 2015, 15, 6589-6603.	4.9	25
69	Title is missing!. Surveys in Geophysics, 2001, 22, 589-596.	4.6	21
70	Foehnâ€“cold pool interactions in the Inn Valley during PIANO IOP2. Quarterly Journal of the Royal Meteorological Society, 2020, 146, 1232-1263.	2.7	19
71	Validation of an Urban Surface Exchange Parameterization for Mesoscale Modelsâ€"1D Case in a Street Canyon. Journal of Applied Meteorology and Climatology, 2005, 44, 1484-1498.	1.7	18
72	Largeâ€eddy simulation of foehnâ€“cold pool interactions in the InnÂValley during PIANO IOPâ€‰2. Quarterly Journal of the Royal Meteorological Society, 2021, 147, 944-982.	2.7	17

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73	Studying Urban Climate and Air Quality in the Alps: The Innsbruck Atmospheric Observatory. Bulletin of the American Meteorological Society, 2020, 101, E488-E507.	3.3	17
74	Current challenges for numerical weather prediction in complex terrain: Topography representation and parameterizations. , 2016, , .		15
75	Multi-scale transport and exchange processes in the atmosphere over mountains. , 2020, , .		15
76	A New Horizontal Length Scale for a Three-Dimensional Turbulence Parameterization in Mesoscale Atmospheric Modeling over Highly Complex Terrain. Journal of Applied Meteorology and Climatology, 2019, 58, 2087-2102.	1.5	14
77	A Method to Identify Synoptically Undisturbed, Clear-Sky Conditions for Valley-Wind Analysis. Boundary-Layer Meteorology, 2019, 173, 435-450.	2.3	13
78	Validating modeled critical crack length for crack propagation in the snow cover model SNOWPACK. Cryosphere, 2019, 13, 3353-3366.	3.9	13
79	Modification of an Operational Dispersion Model for Urban Applications. Journal of Applied Meteorology and Climatology, 2001, 40, 864-879.	1.7	12
80	Building models for daily pollen concentrations. Aerobiologia, 2012, 28, 499-513.	1.7	12
81	Simulation of Pollutant Transport in Complex Terrain with a Numerical Weather Predictionâ€"Particle Dispersion Model Combination. Boundary-Layer Meteorology, 2010, 137, 373-396.	2.3	11
82	Turbulence kinetic energy budget in the stable boundary layer over a heterogeneous surface. Quarterly Journal of the Royal Meteorological Society, 2018, 144, 1045-1062.	2.7	11
83	CROSSINN: A Field Experiment to Study the Three-Dimensional Flow Structure in the Inn Valley, Austria. Bulletin of the American Meteorological Society, 2021, 102, E38-E60.	3.3	10
84	Supplement to MAP D-PHASE: Real-Time Demonstration of Weather Forecast Quality in the Alpine Region: Additional Applications of the D-Phase Datasets. Bulletin of the American Meteorological Society, 2009, 90, S28-S32.	3.3	9
85	Flux Footprints Over an Undulating Surface. Boundary-Layer Meteorology, 2010, 136, 325-340.	2.3	9
86	Toward Generalizing the Impact of Surface Heating, Stratification, and Terrain Geometry on the Daytime Heat Export from an Idealized Valley. Journal of Applied Meteorology and Climatology, 2017, 56, 2711-2727.	1.5	9
87	Practical considerations to speed up Lagrangian stochastic particle models. Computers and Geosciences, 2002, 28, 143-154.	4.2	8
88	On the efficiency and correction of vertically oriented blunt bioaerosol samplers in moving air. International Journal of Biometeorology, 2012, 56, 1113-1121.	3.0	8
89	Assessing the added value of the Intermediate Complexity Atmospheric Research (ICAR) model for precipitation in complex topography. Hydrology and Earth System Sciences, 2019, 23, 2715-2734.	4.9	8
90	Deriving turbulence characteristics from the COSMO numerical weather prediction model for dispersion applications. Advances in Science and Research, 2009, 3, 79-84.	1.0	8

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91	Sensitivity of modeled snow stability data to meteorological input uncertainty. Natural Hazards and Earth System Sciences, 2020, 20, 2873-2888.	3.6	8
92	Monthly Weather Forecasts in a Pest Forecasting Context: Downscaling, Recalibration, and Skill Improvement. Journal of Applied Meteorology and Climatology, 2012, 51, 1633-1638.	1.5	7
93	Modeling spatially distributed snow instability at a regional scale using Alpine3D. Journal of Glaciology, 2021, 67, 1147-1162.	2.2	7
94	Cold-Air Pool Processes in the Inn Valley During FÃ¶hn: A Comparison of Four Cases During the PIANO Campaign. Boundary-Layer Meteorology, 2022, 182, 335-362.	2.3	7
95	A Collaborative Effort to Better Understand, Measure, and Model Atmospheric Exchange Processes over Mountains. Bulletin of the American Meteorological Society, 2022, 103, E1282-E1295.	3.3	7
96	Extension of an operational short-range dispersion model for applications in an urban environment. International Journal of Vehicle Design, 1998, 20, 105.	0.3	6
97	Parametric gridded weather generator for use in present and future climates: focus on spatial temperature characteristics. Theoretical and Applied Climatology, 2020, 139, 1031-1044.	2.8	6
98	Spatial and temporal variations in nearâ€surface energy fluxes in an Alpine valley under synoptically undisturbed and clearâ€sky conditions. Quarterly Journal of the Royal Meteorological Society, 2021, 147, 2173-2196.	2.7	6
99	Application of Statistical Weather Data From the Numerical Weather Prediction Model COSMO-2 for Noise Mapping Purposes. Acta Acustica United With Acustica, 2011, 97, 403-415.	0.8	5
100	Uncertainty propagation for flood forecasting in the Alps: different views and impacts from MAP D-PHASE. Natural Hazards and Earth System Sciences, 2012, 12, 2439-2448.	3.6	5
101	A process-based evaluation of the Intermediate Complexity Atmospheric Research Model (ICAR) 1.0.1. Geoscientific Model Development, 2021, 14, 1657-1680.	3.6	5
102	Influence of grid resolution of largeâ€eddy simulations on foehnâ€cold pool interaction. Quarterly Journal of the Royal Meteorological Society, 2022, 148, 1840-1863.	2.7	5
103	Subsiding shells and the distribution of up- and downdraughts in warm cumulus clouds over land. Atmospheric Chemistry and Physics, 2019, 19, 9769-9786.	4.9	4
104	Energy and mass exchange at an urban site in mountainous terrain â€“ the Alpine city of Innsbruck. Atmospheric Chemistry and Physics, 2022, 22, 6559-6593.	4.9	4
105	Commentaries on Top-Cited Boundary-Layer Meteorology Articles. Boundary-Layer Meteorology, 2020, 177, 169-188.	2.3	3
106	Estimating Ensemble Flood Forecastsâ€™ Uncertainty: A Novel â€œPeak-Boxâ€•Approach for Detecting Multiple Peak-Flow Events. Atmosphere, 2020, 11, 2.	2.3	3
107	Crossâ€valley vortices in the Inn valley, Austria: Structure, evolution and governing force imbalances. Quarterly Journal of the Royal Meteorological Society, 2021, 147, 3835-3861.	2.7	3
108	Roof Level Urban Tracer Experiment: Measurements and Modelling. , 2004, , 471-479.		3

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109	COST 715 WORKSHOP ON URBAN BOUNDARY LAYER PARAMETERIZATIONS. Bulletin of the American Meteorological Society, 2002, 83, 1501-1504.	3.3	3
110	Numerically consistent budgets of potential temperature, momentum, and moisture in Cartesian coordinates: application to the WRF model. Geoscientific Model Development, 2022, 15, 669-681.	3.6	3
111	Transport and Exchange Processes in the Atmosphere over Mountainous Terrain: Perspectives and Challenges for Observational and Modelling Systems, from Local to Climate Scales. Atmosphere, 2021, 12, 199.	2.3	2
112	Evaluation of a stochastic weather generator in simulating univariate and multivariate climate extremes in different climate zones across Europe. Meteorologische Zeitschrift, 2021, 30, 127-151.	1.0	2
113	Investigating the Surface Energy Balance in Urban Areas â€" Recent Advances and Future Needs. , 2002, , 1-16.		2
114	A two-dimensional Lagrangian stochastic dispersion model for daytime conditions. Quarterly Journal of the Royal Meteorological Society, 1996, 122, 367-3898.	2.7	2
115	The Treatment of Relative Dispersion Within a Combined Puff-Particle Model (PPM). , 1998, , 389-398.		2
116	The effect of mountainous topography on moisture exchange between the â€œsurfaceâ€•and the free atmosphere. , 2007, , 71-88.		1
117	Comment on: â€œCorrections to the Mathematical Formulation of a Backwards Lagrangian Particle Dispersion Modelâ€•by Gibson and Sailor (2012: Boundary-Layer Meteorology 145, 399â€"406). Boundary-Layer Meteorology, 2018, 166, 153-160.	2.3	1
118	A Method to Speed up a Lagrangian Stochastic Particle Dispersion Model. , 2000, , 509-517.		1
119	Papers from the DACHÂ2013 conference at Innsbruck, Austria. Meteorologische Zeitschrift, 2014, 23, 191-192.	1.0	0
120	Introduction of a Puff-Particle Approach for Near-Source Dispersion into the Calpuff Model. , 2000, , 147-155.		0
121	Urban Effects on Air Pollutant Dispersion in Very Complex Terrain: The Athens Case. , 2004, , 601-602.		0
122	Air Quality of the Urban Alps: Innsbruckâ€™s new observatory. Bulletin of the American Meteorological Society, 2020, 101, 492-498.	3.3	0
123	Including the Urban Canopy Layer in a Lagrangian Particle Dispersion Model. Boundary-Layer Meteorology, 0, , .	2.3	0