David G Dritschel

List of Publications by Year
in descending order

150 papers	5,122 citations	76196 40 h-index	98622 67 g-index
160 all docs	160 docs citations	160 times ranked	1669 citing authors

#	Article	IF	Citations
1	Contour dynamics and contour surgery: Numerical algorithms for extended, high-resolution modelling of vortex dynamics in two-dimensional, inviscid, incompressible flows. Computer Physics Reports, 1989, 10, 77-146.	2.3	277
2	Multiple Jets as PV Staircases: The Phillips Effect and the Resilience of Eddy-Transport Barriers. Journals of the Atmospheric Sciences, 2008, 65, 855-874.	0.6	276
3	Contour surgery: A topological reconnection scheme for extended integrations using contour dynamics. Journal of Computational Physics, 1988, 77, 240-266.	1.9	229
4	Quantification of the inelastic interaction of unequal vortices in two-dimensional vortex dynamics. Physics of Fluids A, Fluid Dynamics, 1992, 4, 1737-1744.	1.6	188
5	The stability and energetics of corotating uniform vortices. Journal of Fluid Mechanics, 1985, 157, 95-134.	1.4	183
6	A general theory for two-dimensional vortex interactions. Journal of Fluid Mechanics, 1995, 293, 269-303.	1.4	154
7	A contour-advective semi-lagrangian numerical algorithm for simulating fine-scale conservative dynamical fields. Quarterly Journal of the Royal Meteorological Society, 1997, 123, 1097-1130.	1.0	143
8	The nonlinear evolution of rotating configurations of uniform vorticity. Journal of Fluid Mechanics, 1986, 172, 157.	1.4	142
9	Vortex stripping and the erosion of coherent structures in two-dimensional flows. Physics of Fluids, 1994, 6, 3954-3962.	1.6	121
10	The stability of a two-dimensional vorticity filament under uniform strain. Journal of Fluid Mechanics, 1991, 230, 647-665.	1.4	106
11	Wave and vortex dynamics on the surface of a sphere. Journal of Fluid Mechanics, 1993, 255, 35.	1.4	99
12	Nonlinear stability bounds for inviscid, two-dimensional, parallel or circular flows with monotonic vorticity, and the analogous three-dimensional quasi-geostrophic flows. Journal of Fluid Mechanics, 1988, 191, 575.	1.4	86
13	On the stabilization of a two-dimensional vortex strip by adverse shear. Journal of Fluid Mechanics, 1989, 206, 193-221.	1.4	86
14	The repeated filamentation of two-dimensional vorticity interfaces. Journal of Fluid Mechanics, 1988, 194, 511.	1.4	85
15	The stability of elliptical vortices in an external straining flow. Journal of Fluid Mechanics, 1990, 210, 223-261.	1.4	83
16	Vortex properties of two-dimensional turbulence. Physics of Fluids A, Fluid Dynamics, 1993, 5, 984-997.	1.6	79
17	The instability and breakdown of tall columnar vortices in a quasi-geostrophic fluid. Journal of Fluid Mechanics, 1996, 328, 129-160.	1.4	79
18	A balanced approach to modelling rotating stably stratified geophysical flows. Journal of Fluid Mechanics, 2003, 488, 123-150.	1.4	72

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19	Vortex stripping and the generation of high vorticity gradients in two-dimensional flows. Flow, Turbulence and Combustion, 1993, 51, 445-455.	0.2	70
20	Vertical velocity in mesoscale geophysical flows. Journal of Fluid Mechanics, 2003, 483, 199-223.	1.4	68
21	The structure of zonal jets in geostrophic turbulence. Journal of Fluid Mechanics, 2012, 711, 576-598.	1.4	68
22	The shape of vortices in quasi-geostrophic turbulence. Journal of Fluid Mechanics, 2003, 474, 175-192.	1.4	67
23	Three-dimensional quasi-geostrophic contour dynamics, with an application to stratospheric vortex dynamics. Quarterly Journal of the Royal Meteorological Society, 1994, 120, 1267-1297.	1.0	65
24	Hierarchies of Balance Conditions for thef-Plane Shallow-Water Equations. Journals of the Atmospheric Sciences, 2001, 58, 2411-2426.	0.6	59
25	On the persistence of non-axisymmetric vortices in inviscid two-dimensional flows. Journal of Fluid Mechanics, 1998, 371, 141-155.	1.4	57
26	The Contour-Advective Semi-Lagrangian Algorithm for the Shallow Water Equations. Monthly Weather Review, 1999, 127, 1551-1565.	0.5	57
27	The merger of vertically offset quasi-geostrophic vortices. Journal of Fluid Mechanics, 2002, 469, 287-315.	1.4	56
28	Generalized helical Beltrami flows in hydrodynamics and magnetohydrodynamics. Journal of Fluid Mechanics, 1991, 222, 525.	1.4	54
29	A Comparison of the Contour Surgery and Pseudo-spectral Methods. Journal of Computational Physics, 1993, 104, 287-302.	1.9	51
30	The elliptical model of twoâ€dimensional vortex dynamics. I: The basic state. Physics of Fluids A, Fluid Dynamics, 1991, 3, 845-854.	1.6	50
31	Unifying Scaling Theory for Vortex Dynamics in Two-Dimensional Turbulence. Physical Review Letters, 2008, 101, 094501.	2.9	49
32	The three-dimensional vortical nature of atmospheric and oceanic turbulent flows. Physics of Fluids, 1999, 11, 1512-1520.	1.6	48
33	A Numerical Investigation of the Stability of Isolated Shallow Water Vortices. Journal of Physical Oceanography, 2000, 30, 2562-2573.	0.7	48
34	The roll-up of vorticity strips on the surface of a sphere. Journal of Fluid Mechanics, 1992, 234, 47.	1.4	45
35	Modeling Oceanic and Atmospheric Vortices. Physics Today, 1993, 46, 44-51.	0.3	45
36	The stability of filamentary vorticity in two-dimensional geophysical vortex-dynamics models. Journal of Fluid Mechanics, 1991, 231, 575-598.	1.4	44

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37	The dynamics of long frontal waves in the shallow‐water equations. Physics of Fluids A, Fluid Dynamics, 1993, 5, 1089-1091.	1.6	44
38	Optimal potential vorticity balance of geophysical flows. Journal of Fluid Mechanics, 2004, 521, 343-352.	1.4	43
39	The critical merger distance between two co-rotating quasi-geostrophic vortices. Journal of Fluid Mechanics, 2005, 522, 357-381.	1.4	43
40	Vortex merger in rotating stratified flows. Journal of Fluid Mechanics, 2002, 455, 83-101.	1.4	42
41	The quasi-geostrophic ellipsoidal vortex model. Journal of Fluid Mechanics, 2004, 505, 201-223.	1.4	42
42	Vanishing enstrophy dissipation in two-dimensional Navier–Stokes turbulence in the inviscid limit. Journal of Fluid Mechanics, 2006, 559, 107.	1.4	42
43	Spontaneous generation of inertia–gravity wave packets by balanced geophysical flows. Journal of Fluid Mechanics, 2006, 553, 107.	1.4	42
44	On the nature of vortex interactions and models in unforced nearly‐inviscid two‐dimensional turbulence. Physics of Fluids, 1996, 8, 1252-1256.	1.6	40
45	Jet sharpening by turbulent mixing. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2011, 369, 754-770.	1.6	39
46	High gradient phenomena in two‐dimensional vortex interactions. Physics of Fluids, 1995, 7, 539-548.	1.6	37
47	The combined Lagrangian advection method. Journal of Computational Physics, 2010, 229, 5408-5417.	1.9	37
48	Revisiting Batchelor's theory of two-dimensional turbulence. Journal of Fluid Mechanics, 2007, 591, 379-391.	1.4	33
49	Numerical Simulation of a Self-Similar Cascade of Filament Instabilities in the Surface Quasigeostrophic System. Physical Review Letters, 2014, 112, 144505.	2.9	33
50	Contour dynamics/surgery on the sphere. Journal of Computational Physics, 1988, 79, 477-483.	1.9	32
51	Does contour dynamics go singular?. Physics of Fluids A, Fluid Dynamics, 1990, 2, 748-753.	1.6	32
52	A high-resolution, three-dimensional model of Jupiter's Great Red Spot. Journal of Geophysical Research, 2001, 106, 5099-5105.	3.3	32
53	The elliptical model of two‐dimensional vortex dynamics. II: Disturbance equations. Physics of Fluids A, Fluid Dynamics, 1991, 3, 855-869.	1.6	30
54	A fast contour dynamics method for many‐vortex calculations in two‐dimensional flows. Physics of Fluids A, Fluid Dynamics, 1993, 5, 173-186.	1.6	30

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55	The Dependence of Rossby Wave Breaking on the Vertical Structure of the Polar Vortex. Journals of the Atmospheric Sciences, 1999, 56, 2359-2375.	0.6	30
56	Enhancement of Rossby Wave Breaking by Steep Potential Vorticity Gradients in the Winter Stratosphere. Journals of the Atmospheric Sciences, 2004, 61, 904-918.	0.6	28
57	The motion of a fluid ellipsoid in a general linear background flow. Journal of Fluid Mechanics, 2003, 474, 147-173.	1.4	27
58	Potential Vorticity and the Quasigeostrophic and Semigeostrophic MesoscaleVertical Velocity. Journal of Physical Oceanography, 2004, 34, 865-887.	0.7	27
59	Balance in non-hydrostatic rotating stratified turbulence. Journal of Fluid Mechanics, 2008, 596, 201-219.	1.4	27
60	The HyperCASL algorithm: A new approach to the numerical simulation of geophysical flows. Journal of Computational Physics, 2009, 228, 6411-6425.	1.9	27
61	Contour-advective semi-Lagrangian algorithms for many-layer primitive-equation models. Quarterly Journal of the Royal Meteorological Society, 2004, 130, 347-364.	1.0	26
62	Instability of a shallow-water potential-vorticity front. Journal of Fluid Mechanics, 2006, 561, 237.	1.4	26
63	Strong interactions between two corotating quasi-geostrophic vortices. Journal of Fluid Mechanics, 2007, 592, 117-133.	1.4	26
64	An exact steadily rotating surface quasi-geostrophic elliptical vortex. Geophysical and Astrophysical Fluid Dynamics, 2011, 105, 368-376.	0.4	26
65	On the simulation of nearly inviscid two-dimensional turbulence. Journal of Computational Physics, 2009, 228, 2707-2711.	1.9	23
66	The steady-state form of large-amplitude internal solitary waves. Journal of Fluid Mechanics, 2011, 666, 477-505.	1.4	21
67	Interaction between two quasi-geostrophic vortices of unequal potential vorticity. Journal of Fluid Mechanics, 2008, 597, 395-414.	1.4	20
68	Numerical simulation of shear-induced instabilities in internal solitary waves. Journal of Fluid Mechanics, 2011, 683, 263-288.	1.4	20
69	The CASL algorithm for quasi-geostrophic flow in a cylinder. Journal of Computational Physics, 2003, 188, 232-251.	1.9	19
70	The stability of quasi-geostrophic ellipsoidal vortices. Journal of Fluid Mechanics, 2005, 536, 401-421.	1.4	19
71	Revisiting the Rossby–Haurwitz wave test case with contour advection. Journal of Computational Physics, 2006, 217, 473-484.	1.9	19
72	Vortex Dipole Formation by Baroclinic Instability of Boundary Currents. Journal of Physical Oceanography, 2007, 37, 1661-1677.	0.7	18

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73	Assessing the Numerical Accuracy of Complex Spherical Shallow-Water Flows. Monthly Weather Review, 2007, 135, 3876-3894.	0.5	17
74	Effective degrees of nonlinearity in a family of generalized models of two-dimensional turbulence. Physical Review E, 2010, 81, 016301.	0.8	17
75	Quasi-geostrophic shallow-water vortexâ€"patch equilibria and their stability. Geophysical and Astrophysical Fluid Dynamics, 2012, 106, 574-595.	0.4	17
76	Vortexâ€"Vortex Interactions in the Winter Stratosphere. Journals of the Atmospheric Sciences, 2006, 63, 726-740.	0.6	15
77	The persistence of balance in geophysical flows. Journal of Fluid Mechanics, 2007, 570, 365-383.	1.4	15
78	Instability in internal solitary waves with trapped cores. Physics of Fluids, 2012, 24, .	1.6	15
79	Imperfect Bifurcation for the Quasi-Geostrophic Shallow-Water Equations. Archive for Rational Mechanics and Analysis, 2019, 231, 1853-1915.	1.1	15
80	The stability of a quasi-geostrophic ellipsoidal vortex in a background shear flow. Journal of Fluid Mechanics, 2006, 560, 1.	1.4	14
81	Destructive interactions between two counter-rotating quasi-geostrophic vortices. Journal of Fluid Mechanics, 2009, 639, 195-211.	1.4	14
82	Two-dimensional magnetohydrodynamic turbulence in the small magnetic Prandtl number limit. Journal of Fluid Mechanics, 2012, 703, 85-98.	1.4	14
83	Quasi-geostrophic shallow-water doubly-connected vortex equilibria and theirÂstability. Journal of Fluid Mechanics, 2013, 723, 40-68.	1.4	14
84	Vortical control of forced two-dimensional turbulence. Physics of Fluids, 2013, 25, .	1.6	14
85	A family of helically symmetric vortex equilibria. Journal of Fluid Mechanics, 2009, 634, 245.	1.4	13
86	Late time evolution of unforced inviscid two-dimensional turbulence. Journal of Fluid Mechanics, 2009, 640, 215-233.	1.4	13
87	The deflection angle between a wind-forced surface current and the overlying wind in an ocean with vertically varying eddy viscosity. Physics of Fluids, 2020, 32, .	1.6	13
88	The Diabatic Contour Advective Semi-Lagrangian Model. Monthly Weather Review, 2006, 134, 2503-2514.	0.5	12
89	The stability and nonlinear evolution of quasi-geostrophic toroidal vortices. Journal of Fluid Mechanics, 2019, 863, 60-78.	1.4	12
90	Impeded inverse energy transfer in the Charneyâ€"Hasegawaâ€"Mima model of quasi-geostrophic flows. Journal of Fluid Mechanics, 2006, 551, 435.	1.4	11

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91	An explicit potential-vorticity-conserving approach to modelling nonlinear internal gravity waves. Journal of Fluid Mechanics, 2002, 458, 75-101.	1.4	10
92	Quasi-geostrophic vortices in compressible atmospheres. Journal of Fluid Mechanics, 2005, 530, 305-325.	1.4	10
93	The Diabatic Contour-Advective Semi-Lagrangian Algorithms for the Spherical Shallow Water Equations. Monthly Weather Review, 2009, 137, 2979-2994.	0.5	10
94	Energy dissipation and resolution of steep gradients in one-dimensional Burgers flows. Physics of Fluids, 2010, 22, 037102.	1.6	10
95	Quasigeostrophic and stratified turbulence in the atmosphere. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 117-130.	0.1	10
96	The role of boundary conditions in the simulation of rotating, stratified turbulence. Geophysical and Astrophysical Fluid Dynamics, 2000, 92, 233-253.	0.4	9
97	Destabilization of barotropic flows small-scale topography. Journal of Fluid Mechanics, 2004, 517, 359-374.	1.4	9
98	Homostrophic vortex interaction under external strain, in a coupled QG-SQG model. Regular and Chaotic Dynamics, 2010, 15, 66-83.	0.3	9
99	Mixing in two-dimensional vortex interactions. Physics of Fluids, 2000, 12, 3285-3288.	1.6	8
100	Scale-invariant singularity of the surface quasigeostrophic patch. Journal of Fluid Mechanics, 2019, 863, .	1.4	8
101	Large-scale dynamics in two-dimensional Euler and surface quasigeostrophic flows. Physics of Fluids, 2006, 18, 121703.	1.6	7
102	On the regularity of the Green–Naghdi equations for a rotating shallow fluid layer. Journal of Fluid Mechanics, 2019, 865, 100-136.	1.4	7
103	Stability and evolution of two opposite-signed quasi-geostrophic shallow-water vortex patches. Geophysical and Astrophysical Fluid Dynamics, 2020, 114, 561-587.	0.4	7
104	Generation of harmonics and sub-harmonics from an internal tide in a uniformly stratified fluid: numerical and laboratory experiments. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 51-62.	0.1	7
105	Introduction to "Contour Dynamics for the Euler Equations in Two Dimensions" Journal of Computational Physics, 1997, 135, 217-219.	1.9	6
106	Dynamic Potential Vorticity Initialization and the Diagnosis of Mesoscale Motion. Journal of Physical Oceanography, 2004, 34, 2761-2773.	0.7	6
107	Bending and twisting instabilities of columnar elliptical vortices in a rotating strongly stratified fluid. Journal of Fluid Mechanics, 2006, 561, 73.	1.4	6
108	Revisiting Vacillations in Shallow-Water Models of the Stratosphere Using Potential-Vorticity-Based Numerical Algorithms. Journals of the Atmospheric Sciences, 2011, 68, 1007-1022.	0.6	6

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109	The effect of slip length on vortex rebound from a rigid boundary. Physics of Fluids, 2013, 25, .	1.6	6
110	Halting scale and energy equilibration in two-dimensional quasigeostrophic turbulence. Journal of Fluid Mechanics, 2013, 721, .	1.4	6
111	Comparison of the Moist Parcelâ€inâ€Cell (MPIC) model with largeâ€eddy simulation for an idealized cloud. Quarterly Journal of the Royal Meteorological Society, 2019, 145, 1865-1881.	1.0	6
112	N-symmetric interaction of N hetons. I. Analysis of the case N = 2. Physics of Fluids, 2020, 32, .	1.6	6
113	Modeling Subsurface Hydrology in Floodplains. Water Resources Research, 2018, 54, 1428-1459.	1.7	5
114	Circulation conservation and vortex breakup in magnetohydrodynamics at low magnetic PrandtlÂnumber. Journal of Fluid Mechanics, 2018, 857, 38-60.	1.4	5
115	The validity of two-dimensional models of a rotating shallow fluid layer. Journal of Fluid Mechanics, 2020, 900, .	1.4	5
116	Fermion self-trapping in the optical geometry of Einstein-Dirac solitons. Physical Review D, 2020, 101, .	1.6	5
117	Nonlinear effects in the excited states of many-fermion Einstein-Dirac solitons. Physical Review D, 2021, 104, .	1.6	5
118	Balance in non-hydrostatic rotating shallow-water flows. Physics of Fluids, 2021, 33, .	1.6	5
119	Downward Wave Propagation on the Polar Vortex. Journals of the Atmospheric Sciences, 2005, 62, 3382-3395.	0.6	5
120	Self-similar collapse of three vortices in the generalised Euler and quasi-geostrophic equations. Physica D: Nonlinear Phenomena, 2022, 434, 133226.	1.3	5
121	A Perspective on Submesoscale Geophysical Turbulence. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 131-141.	0.1	4
122	The structure of zonal jets in shallow water turbulence on the sphere. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 243-252.	0.1	4
123	The interaction of two asymmetric quasi-geostrophic vortex patches. Geophysical and Astrophysical Fluid Dynamics, 2018, 112, 375-401.	0.4	4
124	The moist parcelâ€inâ€cell method for modelling moist convection. Quarterly Journal of the Royal Meteorological Society, 2018, 144, 1695-1718.	1.0	4
125	On spontaneous imbalance and ocean turbulence: generalizations of the Paparellaâ€"Young epsilon theorem. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 3-15.	0.1	4
126	A new, but flawed, numerical method for vortex patch evolution in two dimensions. Journal of Computational Physics, 1991, 93, 481-484.	1.9	3

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127	Long frontal waves and dynamic scaling in freely evolving equivalent barotropic flow. Journal of Fluid Mechanics, 2019, 866, .	1.4	3
128	Velocity–pressure correlation in Navier–Stokes flows and the problem of global regularity. Journal of Fluid Mechanics, 2021, 911, .	1.4	3
129	Inertia-gravity-wave generation: a geometric-optics approach. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 17-26.	0.1	3
130	Parallels between stratification and rotation in hydrodynamics, and between both of them and external magnetic field in magnetohydrodynamics, with applications to nonlinear waves. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 27-37.	0.1	3
131	Equilibria and stability of four point vortices on a sphere. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2020, 476, 20200344.	1.0	3
132	On the spacing of meandering jets in the strong-stair limit. Journal of Fluid Mechanics, 2022, 930, .	1.4	3
133	Waves and Turbulence: Their Cooperative Role in Structure Formation. Procedia IUTAM, 2013, 8, 85-93.	1.2	2
134	Simply-connected vortex-patch shallow-water quasi-equilibria. Journal of Fluid Mechanics, 2014, 743, 481-502.	1.4	2
135	Point mass dynamics on spherical hypersurfaces. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2019, 377, 20180349.	1.6	2
136	On the regularity of the Green–Naghdi equations – CORRIGENDUM. Journal of Fluid Mechanics, 2020, 900, .	1.4	1
137	Modeling mixing in two-dimensional turbulence and stratified fluids. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 155-167.	0.1	1
138	Zigzag instability of the Kármán vortex street in stratified and rotating fluids. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 197-206.	0.1	1
139	Instabilities of a columnar vortex in a stratified fluid. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 207-215.	0.1	1
140	Jet formation in decaying two-dimensional turbulence on a rotating sphere. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 253-263.	0.1	1
141	Potential vorticity fronts and the late-time evolution of large-scale quasi-geostrophic flows. Journal of Fluid Mechanics, 2022, 939, .	1.4	1
142	Generation of an internal tide by surface tide/eddy resonant interactions. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 39-50.	0.1	0
143	Eddies and Circulation: Lessons from Oceans and the GFD Lab. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 77-94.	0.1	0
144	Shallow-water vortex equilibria and their stability. Journal of Physics: Conference Series, 2011, 318, 062019.	0.3	0

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145	Flowâ€"topography interactions in shallow-water turbulence. Geophysical and Astrophysical Fluid Dynamics, 2012, 106, 45-66.	0.4	0
146	Spectra and Distribution Functions of Stably Stratified Turbulence. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 143-154.	0.1	0
147	Observations on Rapidly Rotating Turbulence. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 95-104.	0.1	0
148	Triple cascade behaviour in QG and drift turbulence and generation of zonal jets. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 265-288.	0.1	0
149	The HyperCASL algorithm. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 289-298.	0.1	0
150	EPIC: The Elliptical Parcel-In-Cell method. Journal of Computational Physics: X, 2022, 14, 100109.	1.1	0