

# M.R.E. Proctor: Publications

Last modified: October 18, 2016

## 1975-1980

1. W.V.R. Malkus and M.R.E. Proctor. The macrodynamics of  $\alpha$ -effect dynamos in rotating fluids. *J. Fluid Mech.*, 67:417–443, 1975.
2. M.R.E. Proctor. Numerical solutions of the nonlinear  $\alpha$ -effect dynamo equations. *J. Fluid Mech.*, 80:769–784, 1977.
3. M.R.E. Proctor. On the eigenvalues of kinematic  $\alpha$ -effect dynamos. *Astron. Nachr.*, 298:19–25, 1977.
4. M.R.E. Proctor. The role of mean circulation in parity selection by planetary magnetic fields. *Geo. Astro. Fluid Dyn.*, 8:311–324, 1977.
5. M.R.E. Proctor. Inertial convection at low Prandtl number. *J. Fluid Mech.*, 82:97–114, 1977.
6. M.R.E. Proctor. On Backus' necessary condition for dynamo action in a conducting sphere. *Geo. Astro. Fluid Dyn.*, 9:89–93, 1977.
7. D.J. Galloway, M.R.E. Proctor, & N.O. Weiss. Formation of intense magnetic fields near the surface of the sun. *Nature*, 266:686–689, 1977.
8. D.J. Galloway, M.R.E. Proctor, and N.O. Weiss. Magnetic flux ropes and convection. *J. Fluid Mech.*, 87:243–261, 1978.
9. M.R.E. Proctor and N.O. Weiss. Magnetic flux ropes. In P.H. Roberts and A.M. Soward, editors, *Rotating Fluids in Geophysics*, pages 387–408. Academic Press, 1978.
10. M.R.E. Proctor and D.J. Galloway. The dynamic effect of flux ropes on Rayleigh-Bénard convection. *J. Fluid Mech.*, 90:273–287, 1979.
11. H. Branover, J.C.R. Hunt, M.R.E. Proctor, and E.S. Pierson. Magnetohydrodynamic flows and turbulence: report of the 2nd bat-sheva seminar. *J. Fluid Mech.*, 91:563–580, 1979.
12. M.R.E. Proctor. Necessary conditions for the magnetohydrodynamic dynamo. *Geo. Astro. Fluid Dyn.*, 14:127–145, 1979.
13. C.J. Chapman and M.R.E. Proctor. Nonlinear Rayleigh-Bénard convection between poorly conducting boundaries. *J. Fluid Mech.*, 101:759–782, 1980.
14. C.J. Chapman, S. Childress, and M.R.E. Proctor. Long wavelength convection between poorly conducting boundaries. *Earth Pl. Sci. Lett.*, 51:342–369, 1980.

**1981-1990**

15. M.R.E. Proctor. Steady subcritical thermohaline convection. *J. Fluid Mech.*, 105:507–521, 1981.
16. E. Knobloch and M.R.E. Proctor. Nonlinear periodic convection in double-diffusive systems. *J. Fluid Mech.*, 108:291–316, 1981.
17. M.R.E. Proctor. Planform selection by finite amplitude convection between poorly conducting slabs. *J. Fluid Mech.*, 113:469–485, 1981.
18. D.J. Galloway and M.R.E. Proctor. Magnetic flux expulsion in hexagons. In "Stellar & Planetary Magnetism" (A.M. Soward, ed.) Gordon and Breach, 1982.
19. M.R.E. Proctor. Low order models of oscillatory magnetoconvection. In "Stellar & Planetary Magnetism" (A.M. Soward, ed.) Gordon and Breach, 1982.
20. H.K. Moffatt and M.R.E. Proctor. The role of the helicity spectrum function in turbulent dynamo theory. *Geo. Astro. Fluid Dyn.*, 21:265–283, 1982.
21. M.R.E. Proctor and N.O. Weiss. Magnetoconvection. *Rep. Prog. Phys.*, 45:1317–1379, 1982.
22. W. Arter, M.R.E. Proctor, and D.J. Galloway. New results on the mechanism of magnetic flux pumping by three-dimensional convection. *M.N.R. Astr. Soc.*, 201:57P–61P, 1982.
23. D.J. Galloway and M.R.E. Proctor. The kinematics of hexagonal magnetoconvection. *Geo. Astro. Fluid Dyn.*, 24:109–136, 1983.
24. M.R.E. Proctor. Collective bifurcation of flux sheets in two-dimensional magnetoconvection. *M.N.R. Astr. Soc.*, 204:935–943, 1983.
25. M.R.E. Proctor. Amplification of magnetic fields by compressible convection. In J.O. Stenflo, editor, *Solar and Magnetic Fields : Origins and Coronal Effects*, pages 301–305. 1983.
26. D.R. Fearn and M.R.E. Proctor. Hydromagnetic waves in a differentially rotating sphere. *J. Fluid Mech.*, 128:1–20, 1983.
27. D.R. Fearn and M.R.E. Proctor. The stabilizing role of differential rotation on hydromagnetic waves. *J. Fluid Mech.*, 128:21–36, 1983.
28. D.R. Jenkins and M.R.E. Proctor. The Transition from Roll to Square Cell Solutions in Rayleigh- Bénard Convection. *J. Fluid Mech.*, 139:461–471, 1984.
29. D.R. Fearn and M.R.E. Proctor. Self-consistent Dynamo Models driven by Convective Instabilities. *Phys. Earth Planet. Int.*, 36:78–84, 1984.
30. M.R.E. Proctor and N.O. Weiss. Amplification and maintenance of thin magnetic flux tubes by compressible convection. pages 77–80. 4th European meeting on Solar Physics (ESA SP-220), 1984.

31. H.K. Moffatt and M.R.E. Proctor, editors. *Metallurgical applications of magnetohydrodynamics*. The Metals Society, London, 1984.
32. H.K. Moffatt and M.R.E. Proctor. Topological constraints associated with fast dynamo action. *J. Fluid Mech.*, 154:493–507, 1985.
33. M.R.E. Proctor and J.Y. Holyer. Planform selection in salt fingers. *J. Fluid Mech.*, 168:241–253, 1985.
34. M.R.E. Proctor. Columnar convection in double diffusive systems. *Contemporary Mathematics*, 56:267–276, 1986.
35. D.R. Fearn and M.R.E. Proctor. Dynamically consistent magnetic fields produced by differential rotation. *J. Fluid Mech.*, 178:521–534, 1987.
36. D.R. Fearn and M.R.E. Proctor. On the computation of steady, self-consistent spherical dynamos. *Geo. Astro. Fluid Dyn.*, 38:293–325, 1987.
37. M.R.E. Proctor and C.A. Jones. Strong spatial resonance and travelling waves in Bénard convection. *Phys. Lett.*, A21:224–227, 1987.
38. G.P. Galdi, L.E. Payne, M.R.E. Proctor, and B. Straughan. Convection in thawing subsea permafrost. *Proc. Roy. Soc.*, A414:83–102, 1987.
39. C.A. Jones and M.R.E. Proctor. The interaction of two spatially resonant patterns in thermal convection I. Exact 1:2 resonance. *J. Fluid Mech.*, 188:301–33, 1988.
40. F. Cattaneo, D.W. Hughes, and M.R.E. Proctor. Mean advection effects in turbulence. *Geophys. Astrophys. Fluid Dyn.*, 41:335–342, 1988.
41. E. Knobloch and M.R.E. Proctor. The double Hopf bifurcation with 2:1 resonance. *Proc. Roy. Soc.*, A415:61–90, 1988.
42. D.W. Hughes and M.R.E. Proctor. Magnetic fields in the solar convection zone: magnetoconvection and magnetic buoyancy. *Ann. Rev. Fluid Mech.*, 20:187–223, 1988.
43. N.E. Hurlburt, M.R.E. Proctor, N.O. Weiss, and D.P. Brownjohn. Nonlinear compressible magnetoconvection part 1. travelling waves and oscillations. *J. Fluid Mech.*, 207:587–628, 1989.
44. G. Belvedere and M.R.E. Proctor. Nonlinear dynamo modes and timescales of stellar activity. In J.O. Stenflo, editor, *Proceedings of IAU Symposium 138: 'Solar Photosphere: Structure, Convection and Magnetic Fields'*, pages 447–453. Kluwer, 1989.
45. D.R. Fearn and M.R.E. Proctor, editors. *Earth's Core Boundary and Geodynamos*, Geophysical and Astrophysical Fluid Dynamics volume 49. 1989.
46. G. Belvedere, R.M. Piddatella, and M.R.E. Proctor. Nonlinear dynamics of a stellar dynamo in a spherical shell. *Geophys. Astrophys. Fluid Dyn.*, 51:263–286, 1990.

47. M.R.E. Proctor and D.Gubbins. Analysis of geomagnetic directional data. *Geophys. J. Int.*, 100:69–77, 1990.
48. D.W. Hughes and M.R.E. Proctor. A low-order model of the shear instability of convection: chaos and the effect of noise. *Nonlinearity*, 3:127–153, 1990.
49. M. Nagata, M.R.E. Proctor, and N.O. Weiss. Transitions to asymmetry in magnetoconvection. *Geophys. Astrophys. Fluid Dyn.*, 51:211–241, 1990.
50. M.R.E. Proctor and E.G. Zweibel. Current sheet formation in magnetostatic equilibria. In Tsinober Moffatt, editor, *Topological Fluid Dynamics*, pages 187–195. 1990.
51. M.R.E. Proctor and N.O. Weiss. Normal forms and chaos in thermosolutal convection. *Nonlinearity*, 3:619–637, 1990.
52. M.R.E. Proctor and D.W.Hughes. Chaos and the effect of noise for the double Hopf bifurcation with 2:1 resonance. Proceedings of the NATO Workshop ‘Spatio-Temporal Chaos in Dissipative Systems’, ed. F.H.Busse & L.Kramer. New York; Plenum Press, 1990.
53. N.O. Weiss, D.P. Brownjohn, N.E. Hurlburt, and M.R.E. Proctor. Oscillatory convection in sunspot umbrae. *Mon. Not. R. Astr. Soc.*, 245:434–452, 1990.
54. D.W. Hughes and M.R.E. Proctor. Chaos and the effect of noise in a model of three-wave mode coupling. *Physica*, 46D:163–176, 1990.
55. G. Belvedere, M.R.E. Proctor, and G. Lanza. Is the Dynamo likely to operate in the boundary layer at the bottom of the convection zone? *Publ. Debrecen Obs.*, 7:174–175, 1990.
56. G.Belvedere, M.R.E. Proctor, and G.Lanza. Internal solar rotation and the boundary layer nonlinear dynamo. In Osaki and Shibahashi, editors, *Progress of Seismology of the Sun and Stars*, pages 353–356. Springer-Verlag, 1990.

**1991-2000**

57. M.R.E. Proctor, Z.S.Qian, and E.A.Spiegel. The gravitational instability of a gaseous slab. *SAACM*, 1:73–93, 1991.
58. M.R.E. Proctor. Instabilities of roll-like patterns for degenerate marginal curves. *Phys. Fluids*, A3:299–303, 1991.
59. M.R.E. Proctor and D.W.Hughes. The false Hopf bifurcation and noise sensitivity in bifurcations with symmetry. *Eur. J. Mech B/Fluids*, 10 (2-suppl.):81–87, 1991.
60. M.R.E. Proctor and E.A.Spiegel. Waves of solar activity. Proc. IAU Colloquium 130 ‘The Sun and Cool Stars: Activity, Magnetism, Dynamos’ (I.Tuominen, ed.) Springer Lecture Notes in Physics, 380, pp 117–128, 1991.
61. G. Belvedere, M.R.E. Proctor, and G. Lanza. Solar internal rotation, boundary layer dynamo and latitude distribution of activity belts. Proc. IAU Colloquium 130 ‘The Sun and Cool Stars: Activity, Magnetism, Dynamos’ (I.Tuominen, ed.) Springer Lecture Notes in Physics, 380, pp. 237–241, 1991.
62. G. Belvedere, M.R.E. Proctor, and G. Lanza. The latitude belts of Solar activity as a consequence of a boundary layer dynamo. *Nature*, 350:491–493, 1991.
63. P.C. Matthews, N.E. Hurlburt, M.R.E. Proctor, and D.P. Brownjohn. Compressible Magnetoconvection in Oblique Fields: Linearised Theory and Simple Nonlinear Models. *J. Fluid Mech.*, 240:559–569, 1992.
64. M.R.E. Proctor and E.G. Zweibel. Dynamos with ambipolar diffusion drifts. *Geophys. Astrophys. Fluid Dyn.*, 64:145–161, 1992.
65. D.W. Hughes and M.R.E. Proctor. Nonlinear three wave resonance with non conservative coupling. *J. Fluid Mech.*, 244:583–604, 1992.
66. E.Knobloch, M.R.E. Proctor, and N.O.Weiss. Heteroclinic bifurcations in a simple model of double-diffusive convection. *J. Fluid Mech.*, 239:273–292, 1992.
67. M.R.E. Proctor and D.R.Fearn. Magnetostrophic balance in non-axisymmetric, non-standard dynamo models. *Geophys. Astrophys. Fluid Dyn.*, 67:117–128, 1992.
68. D.J. Galloway and M.R.E. Proctor. Numerical calculations of fast dynamos in smooth velocity fields with realistic diffusion. *Nature*, 356:691–693, 1992.
69. M.R.E. Proctor. Magnetoconvection. Invited Review in ”Theory and Observations of Sunspots”. 1992.
70. P. Metzener and M.R.E. Proctor. Interaction of patterns with disparate scales. *Eur. J. Mech. B*, 11:759–778, 1992.
71. H.K. Moffatt and M.R.E. Proctor. Summary of the NATO ASI in Cambridge, September 1992. *Deep Earth Dialog*, 6:12–14, 1992.

72. M.R.E. Proctor and N.O.Weiss. Symmetries of time-dependent magnetoconvection. *Geophys. Astrophys. Fluid Dyn.*, 70:137–160, 1993.
73. A.M. Rucklidge, N.O. Weiss, D.P. Brownjohn, and M.R.E. Proctor. Oscillations and secondary bifurcations in nonlinear magnetoconvection. *Geophys. Astrophys. Fluid Dyn.*, 68:133–150, 1993.
74. M.R.E. Proctor. A note on the nonlinear development of the Batchelor-Nitsche instability. *J. Fluid Mech.*, 254:313–321, 1993.
75. R. Hollerbach and M.R.E. Proctor. Nonaxisymmetric Shear Layers in a Rotating Spherical Shell. In M.R.E.Proctor, P.C.Matthews, and A.M.Rucklidge, editors, *Theory of Solar and Planetary Dynamos*. Cambridge University Press, 1993.
76. M.R.E. Proctor and E.G.Zweibel. Dynamos with Ambipolar Diffusion. In M.R.E.Proctor, P.C.Matthews, and A.M.Rucklidge, editors, *Theory of Solar and Planetary Dynamos*. Cambridge University Press, 1993.
77. G.K.Batchelor and J.M.Nitsche. Appendix to: Instability of stratified flow in a vertical cylinder. *J. Fluid Mech.*, 1993.
78. E. Knobloch, , M.R.E. Proctor, and N.O. Weiss. Finite-dimensional description of doubly-diffusive convection. In *Turbulence in Fluid Flows: a Dynamical Systems Approach*, volume 55 of *IMA Volumes in Mathematics and its Applications*, pages 55–72. Minneapolis, 1993.
79. G.D. Lythe and M.R.E. Proctor. Noise and slow-fast dynamics in a three-wave resonance problem. *Phys. Rev. E*, 47:3122–3127, 1993.
80. P.C. Matthews, M.R.E. Proctor, A.M. Rucklidge, and N.O. Weiss. Pulsating Waves in nonlinear magnetoconvection. *Phys. Lett. A*, 183:69–75, 1993.
81. M.R.E. Proctor and G.D. Lythe. Noise and Resonant Mode Interactions. *Proc. N.Y. Acad. Sci.*, 706:42–53, 1993.
82. P. Glendinning and M.R.E. Proctor. Travelling waves with spatially resonant forcing: bifurcations of a modified Landau equation. *Int. J. Bifurcation and Chaos*, 3:1447–1455, 1993.
83. M.R.E. Proctor. Convection and magnetoconvection in a rapidly rotating sphere. In M.R.E.Proctor and A.D.Gilbert, editors, *Lectures on Solar and Planetary Dynamos*. Cambridge University Press, 1994.
84. M.R.E. Proctor, N.O.Weiss, D.P.Brownjohn, and N.E.Hurlburt. Nonlinear Compressible Magnetoconvection Part 2. Streaming Instabilities in Two Dimensions. *J. Fluid Mech.*, 280:227–253, 1994.
85. M.R.E. Proctor. A note on the viscoelastic instability of circular Couette flow. *J. Non-Newt. Fluid Dyn.*, 51:227–230, 1994.



86. P.C. Matthews, M.R.E. Proctor, A.M. Rucklidge, and N.O. Weiss. Nonlinear three-dimensional magnetoconvection in a compressible atmosphere. In M. Schüssler and W.Schmidt, editors, *Solar Magnetic Fields*, pages 279–281. Cambridge University Press, 1994.
87. D.W. Hughes and M.R.E. Proctor. Non-Symmetrical Three-Wave Resonance. *Wave Motion*, 20:201–209, 1994.
88. M. R. E. Proctor and J. Lega. Secondary bifurcations and symmetry breaking as a route towards spatiotemporal disorder. *Int. J. Bifurcation and Chaos*, 5:841–848, 1995.
89. P. C. Matthews, M. R. E. Proctor, and D. W. Hughes. Magnetic buoyancy, vorticity and three-dimensional flux tube formation. *Astrophys J.*, 448:938–941, 1995.
90. D. R. Fearn, M. R. E. Proctor, and C. C. Sellar. Nonlinear magnetoconvection in a rapidly rotating sphere and Taylor’s constraint. *Geophys. Astrophys. Fluid Dyn.*, 77:111–132, 1995.
91. D. P. Brownjohn, N. E. Hurlburt, M. R. E. Proctor, and N. O. Weiss. Nonlinear Compressible Magnetoconvection Part 3. Travelling waves in a horizontal field. *J. Fluid Mech.*, 300:287–309, 1995.
92. P. C. Matthews, M. R. E. Proctor, and N. O. Weiss. Compressible magnetoconvection in three dimensions: planforms and nonlinear behaviour. *J. Fluid Mech.*, 305:281–305, 1995.
93. R. Hollerbach, D. J. Galloway, and M. R. E. Proctor. Numerical evidence of fast dynamo action in a spherical shell. *Phys Rev. Lett.*, 74, 1995.
94. F. Cattaneo, E.-J. Kim, L. Tao, and M. R. E. Proctor. Fluctuations in quasi-two-dimensional fast dynamos. *Phys. Rev. Lett.*, 75:1522–1525, 1995.
95. D. J. Galloway, R. Hollerbach, and M. R. E. Proctor. Fine Structure in Fast Dynamo Computations. In Pouquet Meneguzzi and Sulem, editors, *Small-scale structures in three-dimensional hydro- and magnetohydrodynamic turbulence*, volume 462 of *Lecture Notes in Physics*. 1995.
96. A.M. Rucklidge, M.R.E. Proctor, N.E. Hurlburt, and P.C. Matthews. Nonlinear Compressible Convection in Oblique Magnetic Fields . *Astrophys. J.*, 437:933–938, 1996.
97. P.C. Matthews, A.M. Rucklidge, N.O. Weiss, and M.R.E. Proctor. The three-dimensional development of the shearing instability of convection. *Physics of Fluids A*, 8:1350–1352, 1996.
98. M. R. E. Proctor, N. O. Weiss, and P. C. Matthews. Magnetoconvection in deep fluid layers. In Renardy, Papageorgiou, and Sun (SIAM), editors, *Advances in Multi-Fluid Flows, Proceedings of the AMS-IMS-SIAM Joint Summer Research Conference on Multi-Fluid Flows and Interfacial Instabilities*, pages 399–414. 1996.
99. E. Knobloch, M.R.E. Proctor, A.M. Rucklidge, and N.O. Weiss. Comment on ‘Bifurcations from periodic solution in a simplified model of two-dimensional magnetoconvection’ by N. Bekki and T. Karakisawa. *Phys. Plasmas*, 3:2475–2476, 1996.
100. N. O. Weiss, D. P. Brownjohn, P. C. Matthews, and M. R. E. Proctor. Photospheric convection in strong magnetic fields. *Mon. Not. Roy. Astr. Soc.*, 283:1153–1164, 1996.

101. M. R. E. Proctor and P. C. Matthews.  $\sqrt{2} : 1$  Resonance in Non-Boussinesq Convection. *Physica*, D97:229–241, 1996.
102. S. M. Tobias, M. R. E. Proctor, and E. Knobloch. The Rôle of Absolute Instability in the Solar Dynamo. *Astr. Astrophys.*, 318:L55–L58, 1997.
103. N. Meunier, M. R. E. Proctor, D. D. Sokoloff, A. M. Soward, and S. M. Tobias. Asymptotic properties of a nonlinear  $\alpha\omega$ -dynamo wave: period, amplitude and latitude dependence. *Geophys. Astrophys. Fluid Dyn.*, 86:249–285, 1997.
104. D. Worledge, E. Knobloch, S. M. Tobias, and M. R. E. Proctor. Dynamo waves in infinite and semi-infinite domains. *Proc. Roy. Soc. A*, 453:119–143, 1997.
105. S. M. Tobias, M. R. E. Proctor, and E. Knobloch. Convective and Absolute Instabilities of Fluid Flows in Finite Geometry. *Physica D*, 113:43–72, 1998.
106. M. R. E. Proctor and P. J. Fox. The effects of distant boundaries on pattern forming instabilities. *Phys. Rev. E.*, 57:491–494, 1998.
107. R. Hollerbach, D. J. Galloway, and M.R.E. Proctor. On the adjustment to the Bondi-Gold Theorem in a spherical-shell fast dynamo. *Geophys. Astrophys. Fluid Dyn.*, 87:111–132, 1998.
108. M. Silber and M. R. E. Proctor. Nonlinear competition between small and large hexagonal patterns. *Phys. Rev Lett.*, 81:2450–2453, 1998.
109. L. Tao, N.O. Weiss, D.P. Brownjohn, and M.R.E. Proctor. Flux separation in Stellar Magnetoconvection. *Astrophys. J.*, 496:L39–L42, 1998.
110. L.Tao, M.R.E. Proctor, and N.O.Weiss. Flux expulsion by inhomogeneous turbulence. *MNRAS*, 300:907–914, 1998.
111. M. R. E. Proctor, E. Knobloch, and S. M. Tobias. Boundary Effects and the Role of Noise in Stellar Dynamos. In M. Núñez and A. Ferriz-Mas, editors, *Stellar Dynamos: Nonlinearity and Chaotic Flows*, volume 178 of *ASP Conference Series*, pages 139–150. 1999.
112. G. D. Lythe and M. R. E. Proctor. Predictability of noise-controlled dynamics. *Physica D*, 133:362–370, 1999.
113. J.R. Gog, I. Oprea, M.R.E. Proctor, and A.M. Rucklidge. Destabilization by noise of transverse perturbations to heteroclinic cycles: a simple model and an example from dynamo theory. *Proc. Roy. Soc. A*, 455:4205–4222, 1999.
114. J. G. Wissink, D. W. Hughes, P. C. Matthews, and M.R.E. Proctor. The three-dimensional breakup of a magnetic layer. *Mon. Not. Royal Astr. Soc.*, 318:501–510, 2000.
115. J. G. Wissink, P. C. Matthews, D. W. Hughes, and M. R. E. Proctor. Numerical Simulation of Buoyant Magnetic Flux Tubes. *Astrophys. J.*, 536:982–997, 2000.
116. A.M. Rucklidge, N.O. Weiss, D.P. Brownjohn, P.C. Matthews, and M.R.E. Proctor. Compressible magnetoconvection in three dimensions: pattern formation in a strongly stratified layer. *J. Fluid Mech.*, 419:283–323, 2000.



117. M.R.E. Proctor. The geodynamo. In P. Murdin, editor, *Encyclopaedia of Astronomy and Astrophysics*. Institute of Physics, Bristol, in press, 2000.
118. N.O. Weiss, A.M. Rucklidge, M.R.E. Proctor, P.C. Matthews, and D.P. Brownjohn. Numerical studies of pattern formation in three-dimensional magnetoconvection. *Prog. Theor. Phys. Supp.*, 138:674–683, 2000.
119. M.R.E. Proctor, S.M. Tobias, and E. Knobloch. Noise-sustained structures due to convective instability in finite domains. *Physica D*, 138:674–683, 2000.
120. A. Abdulrahman, C.A. Jones, M. R. E. Proctor, and K. A. Julien. Large wavenumber convection in the rotating annulus. *Geophys. Astrophys. Fluid Dyn.*, 93:227–252, 2000.

**2001-2010**

121. N. O. Weiss and M. R. E. Proctor. Flux separation in photospheric magnetoconvection. In B. Fleck P.Brekke and J.B. Gurman, editors, *Recent Insights into the Physics of the Sun and Heliosphere – Highlights from SOHO and other Space Missions*, number 203 in IAU Symp, pages 219–221. 2001.
122. I.Melbourne, M.R.E. Proctor, and A.M.Rucklidge. A heteroclinic model of geodynamo reversals and excursions. In G. Dangelmayr P. Chossat and J. Oprea, editors, *Dynamo and Dynamics: a Mathematical Challenge*, pages 363–370. Kluwer, Dordrecht, 2001.
123. M.R.E. Proctor. Finite amplitude behaviour of the Matthews-Cox instability. *Physics Letters A*, 292:181–187, 2001.
124. A.R. Halford and M.R.E. Proctor. An oscillatory secondary bifurcation for magnetoconvection and rotating convection at small aspect ratio. *J. Fluid Mech*, 467:241–257, 2002.
125. M.R.E. Proctor. MHD at large Magnetic Reynolds number. Invited review. In P.A.Davidson and A.Thess, editors, *Magnetohydrodynamics*, volume 418 of *CISM Courses and Lectures*, pages 93–108. Springer-Verlag, Vienna, 2002.
126. N. O. Weiss, M. R. E. Proctor, and D. P. Brownjohn. Magnetic flux separation in photospheric convection. *Mon. Not. R. Ast. Soc.*, 337:293–304, 2002.
127. M.R.E. Proctor. Dynamo processes: the interaction of magnetic fields and turbulence. Invited review in: Thompson and Christiansen-Dalsgaard, editors, *New developments in astrophysical fluid dynamics*. Cambridge, 2003.
128. G. I. Ogilvie and M.R.E. Proctor. On the relation between viscoelastic and magnetohydrodynamic flows and their instabilities. *J. Fluid Mech.*, 476:389–409, 2003.
129. I. M. Irurzun, R. B. Hoyle, M.R.E. Proctor, and D. A. King. Modelling pattern formation in  $CO + O_2$  on  $Pt\{1000\}$ . *Chem. Phys. Lett.*, 377:269–278, 2003.
130. M.R.E. Proctor. An extension of the toroidal theorem. *Geophys. Astrophys. Fluid. Dyn* 98:235–240, 2004.
131. J. H. P. Dawes, C. M. Postlethwaite, and M. R. E. Proctor. Instabilities induced by a weak breaking of a strong spatial resonance. *Physica D* 191:1-30, 2004.
132. M.R.E.Proctor. Solar convection and magnetic fields. *Astr. Geophys.*, 45(4):14–20,2004.
133. M.R.E.Proctor. Magnetoconvection. Invited review in: Fluid dynamics and dynamos in astrophysics and geophysics, ed. Soward, Jones, Hughes and Weiss, CRC Press, pp 235-276, 2005.
134. A.M.Rucklidge, M.R.E.Proctor & J.A.Pratt. Mean flow instabilities of two-dimensional convection in strong magnetic fields. *Geophys. Astrophys. Fluid Dyn.* 100:121-138, 2006.

135. M.R.E.Proctor. Dynamo Action and the Sun. In *Stellar Fluid Dynamics and Numerical Simulations: From the Sun to Neutron Stars*. M.Rieutord and B. Dubrulle (eds). EAS Publications Series, 21:241-273, 2006.
136. F.H.Busse & M.R.E.Proctor. Antidynamo and bounding theorems. Article in *Encyclopedia of Geomagnetism and Paeomagnetism*, ed. D.Gubbins & E.Herrero-Bervera, pp. 21–23, Springer, Dordrecht, 2007.
137. M.R.E.Proctor. Fast dynamos. Article in *Encyclopedia of Geomagnetism and Paeomagnetism*, ed. D.Gubbins & E.Herrero-Bervera, pp. 186–188, Springer, Dordrecht, 2007.
138. M.R.E.Proctor. Introduction to dynamo theory. Invited chapter in "Mathematical aspects of natural dynamos", ed. E. Dormy and A.M Soward, pp. 20–41 , CRC Press, Boca Raton 2007.
139. A. B. Iskakov, A. A. Schekochihin, S. C. Cowley, J. C. McWilliams and M. R. E. Proctor. Numerical demonstration of fluctuation dynamo at low magnetic Prandtl numbers. *Phys. Rev. Lett.* 98:208501 , 2007.
140. A.A. Schekochihin, A.B.Iskakov, S.C. Cowley, J.C. McWilliams, M.R.E.Proctor & T.A.Yousef. Fluctuation dynamo and turbulent induction at low magnetic Prandtl numbers. *New Journal of Physics*, 9:300, 2007.
141. L.J.Silvers & M.R.E.Proctor. Interaction of multiple convection zones in A-type stars. *Mon. Not. R. A. S.* 380: 44-50, 2007.
142. F. Rincon, G. I. Ogilvie & M. R. E. Proctor. A self-sustaining nonlinear dynamo process in Keplerian shear flows. *Phys. Rev. Lett.* 98:254502, 2007.
143. Rebecca B. Hoyle, Alexandra T. Anghel, Michael R. Proctor, & David A. King. Pattern Formation during the Oxidation of CO on Pt100: A Mesoscopic Model. *Phys. Rev. Lett.* 98:226102, 2007.
144. Michael.R.E.Proctor. Effects of fluctuation on alpha-omega dynamo models.*Mon. Not. R. A. S.* 382: L39-L42, 2007.
145. L.J.Silvers & M.R.E.Proctor. Interacting convection zones. In '*Unsolved Problems in Stellar Physics*', AIP Conference Proceedings 948: 171-175, 2007.
146. Rebecca B. Hoyle, Alexandra T. Anghel, Isabel M,Iruzun, Michael R. Proctor, & David A. King. Theoretical Study of Pattern Formation during the Catalytic Oxidation of CO on Pt100 at low pressures. *J.Chem Phys.* 127:164711, 2007.
147. J.H.P.Dawes and M.R.E.Proctor. Turing-type instabilities due to strong spatial resonance. *Proc. Roy. Soc A* 464:923-942, 2008.
148. H. Isobe, M. R. E. Proctor & N. O. Weiss. Convection-driven emergence of granular scale magnetic field and its role in coronal heating and solar wind acceleration. *Astrophys.J. Lett.*, 679:L57-L60, 2008.

149. P. J. Bushby, S. M. Houghton, M. R. E. Proctor & N. O. Weiss. Convective intensification of magnetic fields in the quiet Sun. *Mon.Not. R.A.S.*, 387:698-706, 2008.
150. V.V.Pipin & M.R.E. Proctor. Closure tests for mean field magnetohydrodynamics using a self consistent reduced model. *Mon Not. R.A.S.*, 388:367-374, 2008.
151. F.Rincon, G.I.Ogilvie, M.R.E.Proctor & C.Cossu. Subcritical Dynamos in Shear Flows. *Astr. Nachr.*, 329: 750-761,2008
152. M.-K. Lin, L. J. Silvers & M. R. E. Proctor. Three-layer magnetoconvection. *Phys. Lett A*, 373:69-75,2008.
153. S. M. Houghton, S. M. Tobias, E. Knobloch & M. R. E. Proctor. Bistability in the Complex Ginzburg-Landau Equation with Drift. *Physica D*, 238:184196, 2009 doi:10.1016/j.physd.2008.09.011
154. D.W.Hughes & M.R.E.Proctor. Large-scale Dynamo Action driven by Velocity Shear and Rotating Convection. *Phys. Rev.Lett.*, 102:044501, 2009. DOI: 10.1103/PhysRevLett.102.044501.
155. D.W.Hughes & M.R.E.Proctor. Dynamo action in an imposed magnetic field. *Proc. Roy. Soc. A*, 465:1599-1616, 2009; DOI:10.1098/rspa.2008.0493
156. L. J. Silvers, P.J.Bushby & M. R. E. Proctor. Interactions between magnetohydrodynamic shear instabilities and convective flows in the solar interior. *Mon. Not. R. Astr. Soc.* 400: 337-345, 2009. doi: 10.1111/j.1365-2966.2009.15455.x
157. L.J.Silvers, G.M.Vasil, N.H.Brummell & M.R.E.Proctor. Double-diffusive instabilities of a shear-generated magnetic layer. *Astrophys. J.*, 691: L138-L141, 2009. doi: 10.1088/0004-637X/702/1/L14.
158. E.L.Rempel, M. R. E. Proctor & A.C.-L. Chian. A novel type of intermittency in a non-linear dynamo in a compressible flow. *Mon. Not. R. Astr. Soc.* 400, 509-517, 2009. doi: 10.1111/j.1365-2966.2009.15483.x
159. P.D. Mann & M. R. E. Proctor. Competing Local and Non-Local  $\alpha$ -effects for a Simplified Flux Transport Dynamo Model *Mon. Not. R. Astr. Soc.* , 399, L99-L102, 2009. doi: 10.1111/j.1745-3933.2009.00732.x
160. M.R.E. Proctor, K.J. Richardson & P.J. Bushby. Effects of fluctuation on mean-field  $\alpha\Omega$  dynamos. *Magnetohydrodynamics*, 45(2): 145-154, 2009.
161. A.Courvoiser, D.W.Hughes & M.R.E.Proctor. Self-consistent mean field MHD. *Proc. Roy. Soc. A*, 466:583-601, 2010. Published online before print October 29, 2009, doi:10.1098/rspa.2009.0384
162. D.W.Hughes & M.R.E.Proctor. The Turbulent Magnetic Diffusivity Tensor for Time-Dependent Mean Fields. *Phys. Rev Lett.*, 104, 024503, 2010.
163. P.J.Bushby, M.R.E.Proctor & N.O.Weiss. Small-scale dynamo action in compressible convection. IN *Numerical Modeling of Space Plasma Flows*, ASP Conference series Vol. 429, 181-186, 2010. ISBN: 978-1-58381-738-4

164. P.J.Bushby & M.R.E.Proctor. The influence of  $\alpha$ -effect fluctuations and the shear-current effect upon the behaviour of solar mean-field dynamo models. *Mon. Not. R. Astr. Soc.* 409, 1611-1618, 2010: DOI: 10.1111/j.1365-2966.2010.17405.x.
165. S. M. Houghton, S. M. Tobias, E. Knobloch & M. R. E. Proctor. Transient spatiotemporal chaos in the complex Ginzburg-Landau equation on long domains. *Phys.Lett*, 374, 2030-2034, 2010. DOI 10.1016/j.physleta.2010.02.078
166. A.Courvoiser, D.W.Hughes & M.R.E.Proctor. A Self-Consistent Treatment of the Electromotive Force in Magnetohydrodynamics. *Astr. Nachr.*, 331: 667–670, 2010, doi: 10.1002/asna.201011358
167. M.R.E.Proctor, N.O.Weiss, S.D.Thompson & N.T.Roxburgh. Effects of boundary conditions on the onset of convection with tilted magnetic fields. *Geophys. Astrophys. Fluid Dyn.*,105: 82-89, 2010. DOI: 10.1080/03091929.2010.486379
168. Erico L. Rempel, Geoffroy Lesur & Michael R.E. Proctor. Supertransient magnetohydrodynamic turbulence in accretion disks. *Phys.Rev Lett.*, 105, 044501, 2010. doi: 10.1103/PhysRevLett.105.044501.
169. Laurène Jouve, Michael R.E.Proctor & Geoffroy Lesur. Buoyancy-induced time delays in Babcock-Leighton flux-transport dynamo models. *Astr. Astrophys.* 519, A68, 2010.
170. K.J.Richardson & M.R.E.Proctor. Effects of  $\alpha$ -effect fluctuations on simple nonlinear dynamo models. *Geophys. Astrophys. Fluid Dyn.*, 104, 601-618, 2010.

**2011-2020**

171. M.R.E.Proctor & D.W.Hughes. Dynamo mechanisms in rotating convection with shear. *Astrophysical Dynamics: from Satrs to Galaxies. Proceedings IAU Symposium No. 271*, N.H. Brummell, A.S. Brun, M.Miesch & Y.Ponty, eds., 240-246, 2011. doi:10.1017/S1743921311017662
172. Laurène Jouve, Michael R.E. Proctor & Geoffroy Lesur. Can short time delays influence the variability of the solar cycle? *Astrophysical Dynamics: from Satrs to Galaxies. Proceedings IAU Symposium No. 271*, N.H. Brummell, A.S. Brun, M.Miesch & Y.Ponty, eds., 288-296, 2011. doi:10.1017/S1743921311017716
173. Lara J. Silvers, Geoffrey M. Vasil, Nicolas H. Brummell & Michael R. E. Proctor. The Evolution of a Double Diffusive Magnetic Buoyancy Instability. *Astrophysical Dynamics: from Satrs to Galaxies. Proceedings IAU Symposium No. 271*, N.H. Brummell, A.S. Brun, M.Miesch & Y.Ponty, eds., 218-226, 2011. doi:10.1017/S1743921311017649
174. Paul J. Bushby, Michael R.E. Proctor & Nigel O. Weiss. The influence of stratification upon small-scale convectively-driven dynamos. *Astrophysical Dynamics: from Stars to Galaxies. Proceedings IAU Symposium No. 271*, N.H. Brummell, A.S. Brun, M.Miesch & Y.Ponty, eds., 197-204, 2011. doi:10.1017/S1743921311017613
175. G.M.Vasil & M.R.E.Proctor. Dynamic Bifurcations and Pattern Formation in Melting-Boundary Convection. *J.Fluid Mech.*, 686: 77-108, 2011.
176. D.W.Hughes, M.R.E.Proctor & F.Cattaneo. The Alpha-Effect in rotating convection: a comparison of numerical simulations. *Mon. Not. R. Astr. Soc.*, 414: L45-L49, 2011.
177. P.J.Bushby, B. F. N. Favier, M. R. E. Proctor and N. O. Weiss. Convectively-driven dynamo action in the quiet Sun. *Geophys. Astrophys. Fluid Dyn*, 106: 508-523, 2012.
178. A.J. Barker, L.J. Silvers, M.R.E. Proctor and N.O. Weiss. Magnetic buoyancy instabilities in the presence of magnetic flux pumping at the base of the solar convection zone. *Mon. Not. R. Astr. Soc.*, 424: 115-127, 2012.
179. M.R.E.Proctor. Four fragments and a preview. *Geophys. Astrophys. Fluid Dyn*, 106, 547-555, 2012.
180. M.R.E.Proctor. Bounds for growth rates for dynamos with shear. *J. Fluid Mech.*, 697, 504-510, 2012.
181. K.J. Richardson & M.R.E.Proctor. Fluctuating  $\alpha\Omega$  dynamos by iterated matrices. *Mon. Not. R. Astr. Soc.: Letters*, 422, 53-56, 2012. doi: 10.1111/j.1745-3933.2012.01235.x
182. B. F. N. Favier, L. Jouve, W. Edmunds, L.J. Silvers & M.R.E. Proctor. How can twisted magnetic structures naturally emerge from buoyancy instabilities? *Mon. Not. R. Astr. Soc.*, 426, 3349-3359, 2012.
183. K. J. Richardson, R. Hollerbach, & M. R. E. Proctor. From large-scale to small-scale dynamos in a spherical shell. *Phys. Fluids*, 24,107103, 2012.



184. L.Jouve, L.J.Silvers & M.R.E. Proctor. Twisted magnetic structures emerging from buoyancy instabilities. Proc. SF2A, S. Boissier et al., eds. Arxiv:1210.7999.
185. D.W.Hughes & M.R.E.Proctor. The Effect of Velocity Shear on Dynamo Action Due to Rotating Convection. *J. Fluid Mech.*, 717, 395-416, 2013.
186. B.Favier & M.R.E.Proctor. Growth rate degeneracies in kinematic dynamos. *Phys. Rev.E.*, 88, 031001, 2013.
187. B.Favier & M.R.E.Proctor. Kinematic dynamo action in square and hexagonal patterns. *Phys. Rev. E*, 88, 053011, 2013.
188. N.O.Weiss & M.R.E.Proctor. *Magnetoconvection*. Cambridge University Press, 2014.
189. B. Favier, L.J. Silvers and M.R.E.Proctor. Inverse cascade and symmetry breaking in rapidly rotating Boussinesq convection. *Phys. Fluids*, 26, 096605, 2014.
189. B. Favier, L.J. Silvers and M.R.E.Proctor. Erratum: Inverse cascade and symmetry breaking in rapidly rotating Boussinesq convection. *Phys. Fluids*, 27, 079901, 2015.
190. M.R.E.Proctor. Energy requirement for a working dynamo. *Geophys. Astrophys. Fluid Dyn.* 109, 611–614, 2015.
191. V. A. Vladimirov, M. R. E. Proctor and D. W. Hughes. Vortex Dynamics of Oscillating Flows. *Arnold J.Math* 1, 113–126, 2015.
192. R.J.Teed and M.R.E.Proctor. Destruction of large-scale magnetic field in nonlinear simulations of the shear dynamo. *Mon. Not. R. Astr. Soc.*, 458, 2885–2889, 2016.
193. R.E.Goldstein, E.Lauga, A.I.Peschi and M.R.E.Proctor. Elastohydrodynamic Synchronization of Adjacent Beating Flagella. *Phys. Rev. Fluids*, in press, 2016