

K. Hasselmann. Bibliography

1. Hasselmann, K. (1958). Zur Deutung der dreifachen Geschwindigkeitskorrelationen der isotropen Turbulenz. *Deutsche Hydrographische Zeitschrift*, 11, 207–217. doi:<https://doi.org/10.1007/BF02020016>.
2. Hasselmann, K. (1958). Die Totalreflexion von kugelförmigen Kompressionsfronten in elastischen Medien; v. Schmidtsche Kopfwellen. *Zeitschrift für angewandte Mathematik und Mechanik*, 38, 310–312. doi:<https://doi.org/10.1002/zamm.19580380734>.

5 Statistics 289

3. Hasselmann, K. (1960). Grundgleichungen der Seegangsvoraussage. *Schiffstechnik*, 7, 191–195.
4. Hasselmann, K. (1960). Die Totalreflexion einer kugelförmigen Kompressionsfront an der Trennungsebene zweier elastischer Medien. *Zeitschrift für angewandte Mathematik und Mechanik*, 40, 464–472. doi:<https://doi.org/10.1002/zamm.19600401005>.
5. Hasselmann, K. (1961). Über den nichtlinearen Energieaustausch innerhalb eines Seegangsspektrums. *Zeitschrift für angewandte Mathematik und Mechanik*, 41 (S1), T137-T138. doi:<https://doi.org/10.1002/zamm.19610411372>.
6. Hasselmann, K. (1962). On the non-linear energy transfer in a gravitywave spectrum: Part 1. General theory. *Journal of Fluid Mechanics*, 12, 481–500. doi:<https://doi.org/10.1017/S0022112062000373>
7. Hasselmann, K. (1962). Über zufallserregte Schwingungssysteme. *Zeitschrift für angewandte Mathematik und Mechanik*, 42, 465–476. doi:<https://doi.org/10.1002/zamm.19620421005>.
8. Hasselmann, K. (1963). On the non-linear energy transfer in a gravity wave spectrum: Part 2. Conservation theorems; wave-particle analogy; irreversibility. *Journal of Fluid Mechanics*, 15, 273–281. doi:<https://doi.org/10.1017/S0022112063000239>.
9. Hasselmann, K. (1963). On the non-linear energy transfer in a gravitywave spectrum: Part 3. Evaluation of the energy flux and swell-sea interaction for a Neumann spectrum. *Journal of Fluid Mechanics*, 15, 385–398. doi:<https://doi.org/10.1017/S002211206300032X>.
10. Hasselmann, K. (1963). On the nonlinear energy transfer in a wave spectrum. In *Ocean wave spectra: Proceedings of a conference* (pp. 191–200). Englewood Cliffs: Prentice-Hall.
11. Hasselmann, K., Munk, W., & MacDonald, G. (1963). Bispectra of ocean waves. In M. Rosenblatt (Ed.), *Proceedings of the Symposium on time series analysis* (pp. 125–139). Wiley: New York.
12. Hasselmann, K. (1963). A statistical analysis of the generation of microseisms. *Reviews of Geophysics*, 1, 177–210. doi:<https://doi.org/10.1029/RG001i002p00177>.
13. Munk, W., & Hasselmann, K. (1964). Super-resolution of tides. In K. Yoshida (Ed.), *Studies on Oceanography* (pp. 339–344). University of Tokyo Press.
14. Hasselmann, K. (1965). Über Streuprozesse in nichtlinear gekoppelten Wellenfeldern. *Zeitschrift für angewandte Mathematik und Mechanik*, 45(S1), T114–T115. doi:<https://doi.org/10.1002/zamm.19650459058>.
- 290 H. von Storch
15. Hasselmann, K. (1966). On nonlinear ship motions in irregular waves.

Journal of Ship Research, 10, 64–68.

16. Hasselmann, K. (1966). Feynman diagrams and interaction rules of wave-wave scattering processes. *Reviews of Geophysics*, 4, 1–32. doi:<https://doi.org/10.1029/RG004i001p00001>.
 17. Hasselmann, K. F. (1966). Generations of waves by turbulent wind. In R. D. Cooper (Ed.), *Sixth Symposium Naval Hydrodynamics* (pp. 585–592). Washington: Office of Naval Research.
 18. Snodgrass, F. E., Groves, G. W., Hasselmann, K. F., Miller, G. R., Munk, W. H., & Powers, W. H. (1966). Propagation of ocean swell across the Pacific. *Philosophical Transactions of the Royal Society of London, Series A: Mathematical and Physical Sciences*, 259(1103), 431–497. doi:<https://doi.org/10.1098/rsta.1966.0022>.
 19. Hasselmann, K. (1967). A criterion for nonlinear wave stability. *Journal of Fluid Mechanics*, 30, 737–739. doi:<https://doi.org/10.1017/S0022112067001739>.
 20. Hasselmann, K. (1967). Nonlinear interactions treated by methods of theoretical physics (with application to generation of waves by wind). *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 299(1456), 77–103. doi:<https://doi.org/10.1098/rspa.1967.0124>.
 21. Hasselmann, K. (1968). Weak-interaction theory of ocean waves. In M. Holt (Ed.), *Basic developments in fluid dynamics* (pp. 117–182). New York: Academic Press. doi:<https://doi.org/10.1016/B978-0-12-395520-3.50008-6>.
 22. Hasselmann, K., & Collins, J. (1968). Spectral dissipation of finite-depth gravity waves due to turbulent bottom friction. *Journal of Marine Research*, 26, 1–12.
 23. Hasselmann, K., & Wibberenz, G. (1968). Scattering of charged particles by random electromagnetic fields. *Zeitschrift für Geophysik*, 34, 353–388.
 24. Hasselmann, K. (1969). The sea surface. In Morning review lectures of the Second International Oceanographic Congress (pp. 49–54). Paris: UNESCO.
 25. Essen, H.-H., & Hasselmann, K. (1970). Scattering low-frequency sound in the ocean. *Zeitschrift für Geophysik*, 36, 655–678.
 26. Hasselmann, K., & Schieler, M. (1970). Radar backscatter from the sea surface. In *Eighth Symposium Naval Hydrodynamics* (pp. 361–388). Arlington: Office of Naval Research.
- 5 Statistics 291
27. Hasselmann, K. (1970). Wave-driven inertial oscillations. *Geophysical Fluid Dynamics*, 1, 463–502. doi:<https://doi.org/10.1080/03091927009365783>.
 28. Hasselmann, K., & Wibberenz, G. (1970). A note on the parallel diffusion coefficient. *The Astrophysical Journal*, 162, 1049–1051. doi:<https://doi.org/10.1086/150736>.
 29. Wibberenz, G., Hasselmann, K., & Hasselmann, D. (1970). Comparison of particle-field interaction theory with solar proton diffusion coefficients. *Acta Physica Academiae Scientiarum Hungaricae*, 29(Suppl. 2), 37–46.
 30. Hasselmann, K. (1971). Determination of ocean wave spectra from Doppler radio return from the sea surface. *Nature—Physical Science*, 229, 16–17. doi:<https://doi.org/10.1038/physci229016a0>.
 31. Hasselmann, K. (1971). On the mass and momentum transfer between

- short gravity waves and larger-scale motions. *The Journal of Fluid Mechanics*, 50, 189–205. doi:<https://doi.org/10.1017/S002211207102520>.
32. Hasselmann, K. (1972). Die Vorhersage in der Meeresforschung. *Meerestechnik—Marine Technology*, 3, 96–99.
33. Hasselmann, K., Barnett, T., Bouws, E., Carlson, H., Cartwright, D., Enke, K., Ewing, J., Gienapp, A., Hasselmann, D., Kruseman, P., Meerburg, A., Müller, P., Olbers, D., Richter, K., Sell, W., & Walden, H. (1973). Measurements of wind-wave growth and swell decay during the joint North Sea wave project (JONSWAP). *Ergänzungsheft zur Deutschen Hydrographischen Zeitschrift, Reihe A*, Nr. 12.
34. Hasselmann, K. (1973). On the characterisation of the wave field in the problem of ship response. *Schiffstechnik*, 20, 56–60.
35. Hasselmann, K. (1974). On the spectral dissipation of ocean waves due to white capping. *Boundary-Layer Meteorology*, 6, 107–127. doi:<https://doi.org/10.1007/BF00232479>.
36. Alpers, W., Hasselmann, K., & Schieler, M. (1975). Fernerkundung der Meeresoberfläche von Satelliten aus. *Raumfahrtforschung*, 19, 1–7.
37. Hasselmann, K., Ross, D. B., Müller, P., & Sell, W. (1976). A parametric wave prediction model. *Journal of Physical Oceanography*, 6, 200–228. doi: [https://doi.org/10.1175/1520-0485\(1976\)006<200:APWPM>2.0.CO;2](https://doi.org/10.1175/1520-0485(1976)006<200:APWPM>2.0.CO;2).
38. Hasselmann, K. (1976). Stochastic climate models—1. Theory. *Tellus*, 28, 473–485. doi:<https://doi.org/10.3402/tellusa.v28i6.11316>.
- 292 H. von Storch**
39. Frankignoul, C., & Hasselmann, K. (1977). Stochastic climate models—2. Application to sea-surface temperature anomalies and thermocline variability. *Tellus*, 29, 289–305. doi:<https://doi.org/10.3402/tellusa.v29i4.11362>.
40. Hasselmann, K., & Herterich, K. (1977). Klima und Klimavorhersage. *Annalen der Meteorologie*, 12, 42–46.
41. Hasselmann, K. (1977). Application of 2-timing methods in statistical geophysics. *Journal of Geophysics—Zeitschrift für Geophysik*, 43, 351–358.
42. Hasselmann, K., Ross, D., Müller, P., & Sell, W. (1977). A parametric wave prediction model—a reply. *Journal of Physical Oceanography*, 7, 134–137. doi:[https://doi.org/10.1175/1520-0485\(1977\)007<0134:R>2.0.CO;2](https://doi.org/10.1175/1520-0485(1977)007<0134:R>2.0.CO;2).
43. Leipold, G., & Hasselmann, K. (1977). Lösung von Bewegungsgleichungen durch Projektion auf Parametergleichungen, dargestellt an der ozeanischen Deckschicht. *Annalen der Meteorologie*, 12, 50–51.
44. Alpers, W., Hasselmann, K., & Kunstmann, J. (1978). Validity of weak particle-field interaction theory for description of cosmic-ray particle diffusion in random magnetic-fields. *Astrophysics and Space Science*, 58, 259–271. doi:<https://doi.org/10.1007/BF00644516>.
45. Alpers, W., & Hasselmann, K. (1978). The two-frequency microwave technique for measuring ocean-wave spectra from an airplane or satellite. *Boundary-Layer Meteorology*, 13, 215–230. doi:<https://doi.org/10.1007/BF00913873>.
46. Crombie, D., Hasselmann, K., & Sell, W. (1978). High-frequency radar observations of sea waves travelling in opposition to the wind. *Boundary-Layer Meteorology*, 13, 45–54. doi:<https://doi.org/10.1007/BF00913861>.

47. Hasselmann, K., Alpers, W., Barick, D., Crombie, D., Flachi, C., Fung, A., van Huttten, H., Jones, W., De Loor, G., Lipa, B., Long, R., Ross, D., Rufenach, C., Sandham, W., Shemdin, O., Teague, C., Trizna, D., Valenzuela, G., Walsh, E., Wentz, F., & Wright, J. (1978). Radar measurements of wind and waves. *Boundary-Layer Meteorology*, 13, 405–412. doi:<https://doi.org/10.1007/BF00913885>.

48. Hasselmann, K. (1978). On the spectral energy balance and numerical prediction of ocean waves. In A. Favre, & K. Hasselmann (Eds.), *Proceedings of the NATO Symposium on Turbulent Fluxes Through the Sea Surface, Wave Dynamics, and Prediction* (pp. 531–545). Plenum Publ. Corp. doi:https://doi.org/10.1007/978-1-4612-9806-9_35.

5 Statistics 293

49. Shemdin, O., Hasselmann, K., Hsiao, S. V., & Herterich, K. (1978). Nonlinear and linear bottom interaction effects in shallow water. In A. Favre, & K. Hasselmann (Eds.), *Proceedings of the NATO Symposium on Turbulent Fluxes Through the Sea Surface, Wave Dynamics, and Prediction* (pp. 347–372). Plenum Publ. Corp. doi:https://doi.org/10.1007/978-1-4612-9806-9_23.

50. Barnett, T. P., & Hasselmann, K. (1979). Techniques of linear prediction, with application to oceanic and atmospheric fields in the tropical Pacific. *Reviews of Geophysics*, 17, 949–968. doi:<https://doi.org/10.1029/RG017i005p00949>.

51. Gunther, H., Rosenthal, W., Weare, T. J., Worthington, B. A., Hasselmann, K., & Ewing, J. A. (1979). A hybrid parametrical wave prediction model. *Journal of Geophysical Research: Oceans*, 84, 5727–5738. doi:<https://doi.org/10.1029/JC084iC09p05727>.

52. Hasselmann, K. (1979). Linear statistical models. *Dynamics of Atmospheres and Oceans*, 3, 501–521. doi:[https://doi.org/10.1016/0377-0265\(79\)90029-0](https://doi.org/10.1016/0377-0265(79)90029-0).

53. Hasselmann, K. (1979). On the problem of multiple time scales in climate modelling. In W. Bach (Ed.), *Man's impact on climate: Proc. of an Int. Conference, Berlin, 1978* (pp. 43–55). Amsterdam u.a.: Elsevier. doi:<https://doi.org/10.1016/B978-0-444-41766-4.50011-4>.

54. Hasselmann, K. (1979). On the signal-to-noise problem in atmospheric response studies. In D. B. Shaw (Ed.), *Meteorology over the tropical oceans* (pp. 251–259). Bracknell: Royal Meteorological Society.

55. Long, R. B., & Hasselmann, K. (1979). Variational technique for extracting directional spectra from multicomponent wave data. *Journal of Physical Oceanography*, 9, 373–381. doi:[https://doi.org/10.1175/1520-0485\(1979\)009<0373:AVTFED>2.0.CO;2](https://doi.org/10.1175/1520-0485(1979)009<0373:AVTFED>2.0.CO;2).

56. Hasselmann, K. (1980). Ein stochastisches Modell der natürlichen Klimavariabilität. In H. Oeschger (Ed.), *Das Klima: Analysen und Modelle, Geschichte und Zukunft* (pp. 259–260). Berlin, Heidelberg: Springer. doi:https://doi.org/10.1007/978-3-642-67813-4_17.

57. Hasselmann, K. (1980). A simple algorithm for the direct extraction of the two-dimensional surface image spectrum from the return signal of a synthetic aperture radar. *International Journal of Remote Sensing*, 1, 219–240. doi:<https://doi.org/10.1080/01431168.008.948.234>.

58. Herterich, K., & Hasselmann, K. (1980). A similarity relation for the non-linear energy-transfer in a finite-depth gravity-wave spectrum. *Journal of Fluid Mechanics*, 97, 215–224. doi:<https://doi.org/10.1017/S0022112080002522>.

59. Lemke, P., Trinkl, E.W., & Hasselmann, K. (1980). Stochastic dynamic analysis of polar sea ice variability. *Journal of Physical Oceanography*, 10, 2100–2120. doi:[https://doi.org/10.1175/1520-0485\(1980\)011<2100:SDAOPS>2.0.CO;2](https://doi.org/10.1175/1520-0485(1980)011<2100:SDAOPS>2.0.CO;2).
60. Shemdin, O. H., Hsiao, S. V., Carlson, H. E., Hasselmann, K., & Schulze, K. (1980). Mechanisms of wave transformation in finite depth water. *Journal of Geophysical Research: Oceans*, 85, 5012–5018. doi:<https://doi.org/10.1029/JC085iC09p05012>.
61. Barnett, T. P., Preisendorfer, R. W., Goldstein, L. M., & Hasselmann, K. (1981). Significance tests for regression model hierarchies. *Journal of Physical Oceanography*, 11, 1150–1154. doi:[https://doi.org/10.1175/1520-0485\(1981\)011<1150:STFRMH>2.0.CO;2](https://doi.org/10.1175/1520-0485(1981)011<1150:STFRMH>2.0.CO;2).
62. Cardone, V., Carlson, H., Ewing, J. A., Hasselmann, K., Lazanoff, S., McLeish, W., & Ross, D. (1981). The surface wave environment in the GATE B/C Scale—Phase III. *Journal of Physical Oceanography*, 11, 1280–1293. doi:[https://doi.org/10.1175/1520-0485\(1981\)011<1280:TSWEIT>2.0.CO;2](https://doi.org/10.1175/1520-0485(1981)011<1280:TSWEIT>2.0.CO;2).
63. Hasselmann, K. (1981). Construction and verification of stochastic climate models. In A. Berger (Ed.), *Climatic Variations and Variability: Facts and Theories* (pp. 481–497). Dordrecht: D. Reidel Publ. Comp. doi:https://doi.org/10.1007/978-94-009-8514-8_28.
64. Hasselmann, K., & Barnett, T. P. (1981). Techniques of linear prediction for systems with periodic statistics. *Journal of the Atmospheric Sciences*, 38, 2275–2283. doi:[https://doi.org/10.1175/1520-0469\(1981\)038<2275:TOLPFS>2.0.CO;2](https://doi.org/10.1175/1520-0469(1981)038<2275:TOLPFS>2.0.CO;2).
65. Hasselmann, K. (1981). Modeling the global oceanic circulation for climatic space and time scales. In E. B. Kraus, & M. Fieux (Eds.), *NATO Advanced Research Institute on 'Large Scale Transport of Heat and Matter in the Oceans'* (pp. 112–122). Paris: Laboratoire d'Océanographie Physique.
66. Alpers, W., & Hasselmann, K. (1982). Spectral signal to clutter and thermal noise properties of ocean wave imaging synthetic aperture radars. *International Journal of Remote Sensing*, 3, 423–446. doi:<https://doi.org/10.1080/01431168208948413>.
67. Hasselmann, K., & Shemdin, O. H. (1982). Remote sensing experiment in MARSEN (Foreword). *International Journal of Remote Sensing*, 3, 359–361.
68. Hasselmann, K. (1982). An ocean model for climate variability studies. *Progress in Oceanography*, 11, 69–92. doi:[https://doi.org/10.1016/0079-6611\(82\)90004-0](https://doi.org/10.1016/0079-6611(82)90004-0).
- 5 Statistics 295
69. Herterich, K., & Hasselmann, K. (1982). The horizontal diffusion of tracers by surface waves. *Journal of Physical Oceanography*, 12, 704–711. doi:[https://doi.org/10.1175/1520-0485\(1982\)012<704:THDOTB>2.0.CO;2](https://doi.org/10.1175/1520-0485(1982)012<704:THDOTB>2.0.CO;2).
70. Hasselmann, K., & Herterich, K. (1983). Application of inverse modelling techniques to paleoclimatic data. In A. Ghazi (Ed.), *Paleoclimatic Research and Models (PRaM): Report and Proceedings of the Workshop* (pp. 52–68). Dordrecht: D. Reidel Publ. Comp.
71. Barnett, T. P., Heinz, H.-D., & Hasselmann, K. (1984). Statistical prediction of seasonal air temperature over Eurasia. *Tellus Series ADynamic Meteorology and Oceanography*, 36, 132–146. doi:<https://doi.org/10.3402/tellusa.v36i2.11476>.

72. Komen, G. J., Hasselmann, S., & Hasselmann, K. (1984). On the existence of a fully developed wind-sea spectrum. *Journal of Physical Oceanography*, 14, 1271–1285. doi:[https://doi.org/10.1175/1520-0485\(1984\)014<1271:OTECAF>2.0.CO;2](https://doi.org/10.1175/1520-0485(1984)014<1271:OTECAF>2.0.CO;2).
73. Attema, E., Bengtsson, L., Bertotti, L., Cavalieri, L., Cavanie, A., Frassetto, R., Guymer, T., Hasselmann, K., Kaneshige, T., Komen, G., Officer, D., Larsen, S., Louet, J., Pierdicca, N., Powell, J., Rapley, C., Rosenthal, W., Schwenzfeger, K., Thomas, J., Trivero, P., & de Voogt, W. (1985). Report on the Working Group on Wind and Wave Data. In *The use of satellite data in climate models: Proc. of a conference held in Alpach, Austria, 10–12 June 1985* (pp. XIII–XVI). Noordwijk: ESA Scientific and Technical Publications Branch.
74. Hasselmann, K. (1985). Assimilation of microwave data in atmospheric and wave models. In *The use of satellite data in climate models: Proc. of a conference held in Alpach, Austria, 10–12 June 1985* (pp. 47–52). Noordwijk: ESA Scientific and Technical Publications Branch.
75. Hasselmann, K., Raney, R. K., Plant, W. J., Alpers, W., Shuchman, R. A., Lyzenga, D. R., Rufenach, C. L., & Tucker, M. J. (1985). Theory of synthetic aperture radar ocean imaging: A MARSEN view. *Journal of Geophysical Research: Oceans*, 90, 4659–4686. doi:<https://doi.org/10.1029/JC090iC03p04659>.
76. Hasselmann, S., & Hasselmann, K. (1985). The Wave Model EXACTNL. In *Ocean wave modeling* (pp. 249–251). Heidelberg u.a.: Springer. doi:https://doi.org/10.1007/978-1-4757-6055-2_24.
77. Hasselmann, S., & Hasselmann, K. (1985). Computations and parameterizations of the nonlinear energy transfer in a gravity-wave spectrum. Part I: A new method for efficient computations of the exact nonlinear transfer integral. *Journal of Physical Oceanography*, 15, 296 H. von Storch 1369–1377. doi:[https://doi.org/10.1175/1520-0485\(1985\)015<1369:CAPOTN>2.0.CO;2](https://doi.org/10.1175/1520-0485(1985)015<1369:CAPOTN>2.0.CO;2).
78. Hasselmann, S., Hasselmann, K., Allender, J. H., & Barnett, T. P. (1985). Computations and parameterizations of the nonlinear energy transfer in a gravity-wave spectrum. Part II: Parameterizations of the nonlinear energy transfer for application in wave models. *Journal of Physical Oceanography*, 15, 1378–1391. doi:[https://doi.org/10.1175/1520-0485\(1985\)015<1378:CAPOTN>2.0.CO;2](https://doi.org/10.1175/1520-0485(1985)015<1378:CAPOTN>2.0.CO;2).
79. Hasselmann, K. (1986). Wave modelling activities of the WAM Group relevant to ERS-1. In *Proceedings of an ESA Workshop on ERS-1 Wind and Wave Calibration, Schliersee 1986* (pp. 173–175). Noordwijk: ESA Scientific and Technical Publications Branch.
80. Hasselmann, K., Guymer, T., Johnson, D., Kaneshige, T., Lefebvre, M., Rapley, C., Mollo-Christensen, E., Lecomte, P., Conde, J., Svendson, E., & Liferman, A. (1986). The feasibility of an ERS-1 oriented, but scientifically autonomous, international experiment campaign. Report of Working Group 6. In *Proceedings of an ESA Workshop on ERS-1 Wind and Wave Calibration, Schliersee 1986* (pp. 223–227). Noordwijk: ESA Scientific and Technical Publications Branch.
81. Hasselmann, K., & Alpers, W. (1986). The response of Synthetic Aperture Radar to ocean surface waves. In O. M. Phillips, & K. Hasselmann (Eds.), *Wave dynamics and radio probing of the ocean surface: Proc. IUCRM Symposium* (pp. 393–402). Plenum Publ. Corp. doi:https://doi.org/10.1007/978-1-4684-8980-4_27.

82. Kruse, H. A., & Hasselmann, K. (1986). Investigation of processes governing the large-scale variability of the atmosphere using low-order barotropic spectral models as a statistical tool. *Tellus Series A—Dynamic Meteorology and Oceanography*, 38, 12–24. doi:<https://doi.org/10.3402/tellusa.v38i1.11694>.
83. Herterich, K., & Hasselmann, K. (1987). Extraction of mixed layer advection velocities, diffusion coefficients, feedback factors and atmospheric forcing parameters from the statistical analysis of North Pacific SST anomaly fields. *Journal of Physical Oceanography*, 17, 2145–2156. doi:[https://doi.org/10.1175/1520-0485\(1987\)017<2145:EOMLAV>2.0.CO;2](https://doi.org/10.1175/1520-0485(1987)017<2145:EOMLAV>2.0.CO;2).
84. Maier-Reimer, E., & Hasselmann, K. (1987). Transport and storage of CO₂ in the ocean—an inorganic ocean-circulation carbon cycle model. *Climate Dynamics*, 2, 63–90. doi:<https://doi.org/10.1007/BF01054491>.
- 5 Statistics 297
85. Young, I. R., Hasselmann, S., & Hasselmann, K. (1987). Computations of the response of a wave spectrum to a sudden change in wind direction. *Journal of Physical Oceanography*, 17, 1317–1338. doi:[https://doi.org/10.1175/1520-0485\(1987\)017<1317:COTROA>2.0.CO;2](https://doi.org/10.1175/1520-0485(1987)017<1317:COTROA>2.0.CO;2).
86. Hasselmann, K. (1988). PIPs and POPs: The reduction of complex dynamical systems using principal interaction and oscillation patterns. *Journal of Geophysical Research: Atmospheres*, 93, 11015–11021. doi:<https://doi.org/10.1029/JD093iD09p11015>.
87. Hasselmann, K. (1988). Some problems in the numerical simulation of climate variability using high-resolution coupled models. In M. E. Schlesinger (Ed.), *Physically-based modelling and simulation of climate and climatic change: Part 1* (pp. 583–614). Dordrecht: Kluwer Academic Publ. doi:https://doi.org/10.1007/978-94-009-3041-4_14.
88. Sausen, R., Barthel, K., & Hasselmann, K. (1988). Coupled ocean-atmosphere models with flux correction. *Climate Dynamics*, 2, 145–163. doi:<https://doi.org/10.1007/BF01053472>.
89. von Storch, H., Bruns, T., Fischer-Bruns, I., & Hasselmann, K. (1988). Principal oscillation pattern analysis of the 30- to 60-day oscillation in general circulation model equatorial troposphere. *Journal of Geophysical Research: Atmospheres*, 93, 11022–11036. doi:<https://doi.org/10.1029/JD093iD09p11022>.
90. WAM Development and Implementation Group (1988). The WAM Model—A third generation ocean wave prediction model. *Journal of Physical Oceanography*, 18, 1775–1810. doi:[https://doi.org/10.1175/1520-0485\(1988\)018<1775:TWMTGO>2.0.CO;2](https://doi.org/10.1175/1520-0485(1988)018<1775:TWMTGO>2.0.CO;2).
91. Winebrenner, D. P., & Hasselmann, K. (1988). Specular point scattering contribution to the mean Synthetic Aperture Radar image of the ocean surface. *Journal of Geophysical Research: Oceans*, 93, 9281–9294. doi:<https://doi.org/10.1029/JC093iC08p09281>.
92. Hasselmann, K. (1989). Das Klimaproblem—eine Herausforderung an die Forschung. In R. Gerwin (Ed.), *Wie die Zukunft Wurzeln schlug: Aus der Forschung der Bundesrepublik Deutschland* (pp. 145–159). Berlin u.a.: Springer-Verlag.
93. Bruening, C., Alpers, W., & Hasselmann, K. (1990). Monte-Carlo simulation studies of the nonlinear imaging of a two dimensional surface wave field by a synthetic aperture radar. *International Journal of Remote Sensing*, 11, 1695–1727. doi:<https://doi.org/10.1080/>

01,431,169,008,955,125.

298 H. von Storch

94. Hasselmann, K. (1990). Climate and development: scientific efforts and assessment—The state of the art. In H.-J. Karpe, D. Otten, & S. C. Trinidade (Eds.), *Climate and development: climatic change and variability and the resulting social, economic and technological implications* (pp. 67–122). Berlin, Heidelberg: Springer. doi:https://doi.org/10.1007/978-3-642-45670-1_11.
95. Hasselmann, K. (1990). Waves, dreams, and visions. *Johns Hopkins APL Technical Digest*, 11, 366–369.
96. Hasselmann, K. (1990). Equation punctuation argumentation. *Physics Today*, 43, 15.
97. Bakan, S., Chlond, A., Cubasch, U., Feichter, J., Graf, H. F., Graßl, H., Hasselmann, K., Kirchner, I., Latif, M., Roeckner, E., Sausen, R., Schlese, U., Schriever, D., Schult, I., Schumann, U., Sielmann, F., & Welke, W. (1991). Climate response to smoke from the burning oilwells in Kuwait. *Nature*, 351, 367–371. doi:<https://doi.org/10.1038/351367a0>.
98. Donelan, M., Ezraty, R., Banner, M., Hasselmann, K., Janssen, P., Phillips, O., & Dobson, F. (1991). Research needs for better wave forecasting: LEWEX Panel Discussion. In R. C. Beal (Ed.), *Directional ocean wave spectra: measuring, modeling, predicting, and applying* (pp. 196–204). Baltimore: Johns Hopkins University Press.
99. Hasselmann, K. (1991). How well can we predict the climate crisis? In H. Siebert, & Institut für Weltwirtschaft an der Universität Kiel (Eds.), *Environmental Scarcity: The International Dimension* (pp. 165–183). Tübingen: J.C.B. Mohr (Paul Siebeck).
100. Hasselmann, K. (1991). Waves, dreams, and visions (Epilogue). In R. C. Beal (Ed.), *Directional ocean wave spectra: measuring, modeling, predicting, and applying* (pp. 205–208). Baltimore: Johns Hopkins University Press.
101. Hasselmann, K., Hasselmann, S., Brüning, C., & Speidel, A. (1991). Interpretation and application of SAR wave image spectra in wave models. In R. C. Beal (Ed.), *Directional ocean wave spectra: measuring, modeling, predicting, and applying* (pp. 117–124). Baltimore: Johns Hopkins University Press.
102. Hasselmann, K., & Hasselmann, S. (1991). On the nonlinear mapping of an ocean wave spectrum into a synthetic aperture radar image spectrum and its inversion. *Journal of Geophysical Research: Oceans*, 96, 10,713–10,729. doi:<https://doi.org/10.1029/91JC00302>.
- 5 Statistics 299**
103. Hasselmann, K. (1991). Ocean circulation and climate change. *Tellus Series B—Chemical and Physical Meteorology*, 43, 82–103. <https://doi.org/10.3402/tellusb.v43i4.15399>
104. Bauer, E., Hasselmann, K., & Young, I. (1992). Satellite data assimilation in the wave model 3G-WAM. In *Proceedings of the Central Symposium of the “International Space Year” Conference, Munich, Germany, 30. March 4. April 1992* (pp. 377–380). Noordwijk: ESA Publishing Division.
105. Bauer, E., Hasselmann, S., Hasselmann, K., & Graber, H. C. (1992). Validation and assimilation of Seasat altimeter wave heights using the WAM wave model. *Journal of Geophysical Research: Oceans*, 97, 12,671–12,682. doi:<https://doi.org/10.1029/92JC01056>.

106. Cubasch, U., Hasselmann, K., Höck, H., Maier-Reimer, E., Mikolajewicz, U., Santer, B. D., & Sausen, R. (1992). Time-dependent greenhouse warming computations with a coupled ocean-atmosphere model. *Climate Dynamics*, 8, 55–69. doi:<https://doi.org/10.1007/BF00209163>.
107. Hasselmann, K., Sausen, R., Maier-Reimer, E., & Voss, R. (1992). Das Kaltstartproblem bei Klimasimulationen mit gekoppelten Atmosphäre-Ozean-Modellen. *Annalen der Meteorologie*, 27, 153–154.
108. Brüning, C., Hasselmann, S., Hasselmann, K., Lehner, S., & Gerling, T. (1993). On the extraction of ocean wave spectra from ERS-1 SAR wave mode image spectra. In *Proceedings of the first ERS-1 Symposium: Space at the Service of our Environment, 4–6 November 1992, Cannes, France* (pp. 747–752). Noordwijk: ESA Publishing Division.
109. Hasselmann, K., Sausen, R., Maier-Reimer, E., & Voss, R. (1993). On the cold start problem in transient simulations with coupled atmosphere-ocean models. *Climate Dynamics*, 9, 53–61. doi:<https://doi.org/10.1007/BF00210008>.
110. Hasselmann, K. (1993). Optimal fingerprints for the detection of time-dependent climate change. *Journal of Climate*, 6, 1957–1971. doi:[https://doi.org/10.1175/15200442\(1993\)006<1957:OFFTDO>2.0.CO;2](https://doi.org/10.1175/15200442(1993)006<1957:OFFTDO>2.0.CO;2).
111. Heinze, C., & Hasselmann, K. (1993). Inverse multiparameter modeling of paleoclimate Carbon cycle indices. *Quaternary Research*, 40, 281–296. doi:<https://doi.org/10.1006/qres.1993.1082>.
- 300 H. von Storch**
112. Maier-Reimer, E., Mikolajewicz, U., & Hasselmann, K. (1993). Mean circulation of the Hamburg LSG OGCM and its sensitivity to the thermohaline surface forcing. *Journal of Physical Oceanography*, 23, 731–757. doi:[https://doi.org/10.1175/1520-0485\(1993\)023<0731:MCOTHL>2.0.CO;2](https://doi.org/10.1175/1520-0485(1993)023<0731:MCOTHL>2.0.CO;2).
113. Pennell, W. T., Bamett, T. P., Hasselmann, K., Holland, W. R., Karl, T. R., North, G. R., MacCracken, M. C., Moss, M. E., Pearman, G., Rasmusson, E. M., Santer, B. D., Smith, W. K., von Storch, H., Switzer, P., & Zwiers, F. (1993). The detection of anthropogenic climate change. *Fourth Symposium on Global Change Studies* (pp. 21–28). American Meteorological Society.
114. Snyder, R. L., Thacker, W. C., Hasselmann, K., Hasselmann, S., & Barzel, G. (1993). Implementation of an efficient scheme for calculating nonlinear transfer from wave-wave interactions. *Journal of Geophysical Research: Oceans*, 98, 14,507–14,525. doi:<https://doi.org/10.1029/93JC00657>.
115. Brüning, C., Hasselmann, K., Hasselmann, S., Lehner, S., & Gerling, T. (1994). A first evaluation of ERS-1 Synthetic Aperture Radar wave mode data. *The Global Atmosphere and Ocean System*, 2, 61–98.
116. Santer, B. D., Brüggemann, W., Cubasch, U., Hasselmann, K., Höck, H., Maier-Reimer, E., & Mikolajewicz, U. (1994). Signal-to-noise analysis of time-dependent greenhouse warming experiments. Part 1: Pattern analysis. *Climate Dynamics*, 9, 267–285. doi:<https://doi.org/10.1007/BF00204743>.
117. Santer, B. D., Mikolajewicz, U., Brüggemann, W., Cubasch, U., Hasselmann, K., Höck, H., Maier-Reimer, E., & Wigley, T. M. L. (1995). Ocean variability and its influence on the detectability of greenhouse warming signals. *Journal of Geophysical Research: Oceans*, 100, 10,693–

- 10,725. doi:<https://doi.org/10.1029/95JC00683>.
118. von Storch, H., & Hasselmann, K. (1995). Climate variability and change. In G. Hempel (Ed.), *The ocean and the poles: Grand challenges for European cooperation* (pp. 33–58). Jena u.a.: Gustav Fischer Verl.
119. Barzel, G., Long, R. B., Hasselmann, S., & Hasselmann, K. (1996). Wave model fitting using the adjoint technique. In M. A. Donelan, W. H. Hui, & W. J. Plant (Eds.), *The Air-Sea Interface: Radio and Acoustic Sensing, Turbulence and Wave Dynamics* (pp. 347–354). Miami, Florida: Rosenstiel School of Marine and Atmospheric Science, Univ. Miami.
- 5 Statistics 301**
120. Bauer, E., Hasselmann, K., Young, I., & Hasselmann, S. (1996). Assimilation of wave data into the wave model WAM using an impulse response function method. *Journal of Geophysical Research: Oceans*, 101, 3801–3816. doi:<https://doi.org/10.1029/95JC03306>.
121. Hasselmann, K. (1996). The metron model: Towards a unified deterministic theory of fields and particles, Part 1: The Metron concept. *Physics Essays*, 9, 311–325.
122. Hasselmann, K. (1996). The metron model: Towards a unified deterministic theory of fields and particles, Part 2: The Maxwell-Dirac-Einstein system. *Physics Essays*, 9, 460–475.
123. Hasselmann, S., Bruning, C., Hasselmann, K., & Heimbach, P. (1996). An improved algorithm for the retrieval of ocean wave spectra from synthetic aperture radar image spectra. *Journal of Geophysical Research: Oceans*, 101, 16,615–16,629. doi:<https://doi.org/10.1029/96JC00798>.
124. Hasselmann, S., Hasselmann, K., & Brüning, C. (1996). Extraction of wave data from ERS-1 SAR wave mode image spectra. In M. A. Donelan, W. H. Hui, & W. J. Plant (Eds.), *The Air-Sea Interface: Radio and Acoustic Sensing, Turbulence and Wave Dynamics* (pp. 773–780). Miami, Florida: Rosenstiel School of Marine and Atmospheric Science, Univ. Miami.
125. Hegerl, G. C., von Storch, H., Hasselmann, K., Santer, B. D., Cubasch, U., & Jones, P. D. (1996). Detecting greenhouse-gas-induced climate change with an optimal fingerprint method. *Journal of Climate*, 9, 2281–2306. doi:[https://doi.org/10.1175/1520-0442\(1996\)009<2281:DGGICC>2.0.CO;2](https://doi.org/10.1175/1520-0442(1996)009<2281:DGGICC>2.0.CO;2).
126. Lehner, S., Bruns, T., & Hasselmann, K. (1996). Test of a new onboard shiprouting system. In *Proceedings of the Second ERS Applications workshop* (pp. 297–301). Noordwijk: ESA/ESTAC.
127. Lionello, P., Hasselmann, K., & Mellor, G. I. (1996). On the coupling between a surface wave model and a model of the mixed layer in the ocean. In M. A. Donelan, W. H. Hui, & W. J. Plant (Eds.), *The Air-Sea Interface: Radio and Acoustic Sensing, Turbulence and Wave Dynamics* (pp. 195–201). Miami, Florida: Rosenstiel School of Marine and Atmospheric Science, Univ. Miami.
128. Bauer, E., Hasselmann, S., Lionello, P., & Hasselmann, K. (1997). Comparison of assimilation results from an optimal interpolation and the Green's function method using ERS-1 SAR wave mode spectra. In *Third ERS Symposium on Space at the Service of our Environment* (pp. 1131–1136).
- 302 H. von Storch**
129. Hasselmann, K. (1997). Multi-pattern fingerprint method for detection and attribution of climate change. *Climate Dynamics*, 13, 601–611. doi:<https://doi.org/10.1007/s003820050185>.

130. Hasselmann, K. (1997). Climate-change research after Kyoto. *Nature*, 390(6657), 225–226. doi:<https://doi.org/10.1038/36719>.
131. Hasselmann, K. (1997). The metron model: Towards a unified deterministic theory of fields and particles, Part 3: Quantum phenomena. *Physics Essays*, 10, 64–86.
132. Hasselmann, K. (1997). The metron model: Towards a unified deterministic theory of fields and particles, Part 4: The standard model. *Physics Essays*, 10, 269–286.
133. Hasselmann, K. (1997). Climate change—Are we seeing global warming? *Science*, 276 (5314), 914–915. doi:<https://doi.org/10.1126/science.276.5314.914>.
134. Hasselmann, K., Hasselmann, S., Giering, R., Ocaña, V., & von Storch, H. (1997). Sensitivity study of optimal CO₂ emission paths using a simplified Structural Integrated Assessment Model (SIAM). *Climatic Change*, 37, 345–386. doi:<https://doi.org/10.1023/A:1005339625015>.
135. Hegerl, G. C., Hasselmann, K., Cubasch, U., Mitchell, J. F. B., Roeckner, E., Voss, R., & Waszkewitz, J. (1997). Multi-fingerprint detection and attribution analysis of greenhouse gas, greenhouse gasplus-aerosol and solar forced climate change. *Climate Dynamics*, 13, 613–634. doi:<https://doi.org/10.1007/s003820050186>.
136. Heimbach, P., Hasselmann, S., & Hasselmann, K. (1997). Three year global intercomparison of ERS-1 SAR wave mode spectral retrievals with WAM model data. In *Third ERS Symposium on Space at the Service of our Environment* (pp. 1143–1149).
137. Hasselmann, K., & Hasselmann, S. (1998). Multi-actor optimization of greenhouse gas emission paths using coupled integral climate response and economic models. In H.-J. Schellnhuber, & V. Wenzel (Eds.), *Earth systems analysis: integrating science for sustainability—Complemented results of a symposium* (pp. 381–415). Springer. doi:https://doi.org/10.1007/978-3-642-52354-0_20.
138. Hasselmann, K. (1998). Conventional and Bayesian approach to climate-change detection and attribution. *Quarterly Journal of the Royal Meteorological Society*, 124, 2541–2565. doi:<https://doi.org/10.1002/qj.49712455202>.
- 5 Statistics 303**
139. Hasselmann, K. (1998). The metron model: Towards a unified deterministic theory of fields and particles. In A. K. Richter (Ed.), *Understanding Physics* (pp. 155–186). Katlenburg-Lindau: Copernicus Gesellschaft.
140. Heimbach, P., Hasselmann, S., & Hasselmann, K. (1998). Statistical analysis and intercomparison of WAM model data with global ERS-1 SAR wave mode spectral retrievals over 3 years. *Journal of Geophysical Research: Oceans*, 103, 7931–7977. doi:<https://doi.org/10.1029/97JC03203>.
141. Barnett, T. P., Hasselmann, K., Chelliah, M., Delworth, T., Hegerl, G., Jones, P., Rasmusson, E., Roeckner, E., Ropelewski, C., Santer, B., & Tett, S. (1999). Detection and attribution of recent climate change: A status report. *Bulletin of the American Meteorological Society*, 80, 2631–2659. doi:[https://doi.org/10.1175/1520-0477\(1999\)080<2631:DAAORC>2.0.CO;2](https://doi.org/10.1175/1520-0477(1999)080<2631:DAAORC>2.0.CO;2).
142. Hasselmann, K. (1999). Cooperative and non-cooperative multiactor strategies of optimizing greenhouse gas emissions. In H. von Storch (Ed.), *Anthropogenic climate change* (pp. 209–256). Berlin u.a.:

- Springer-Verlag. doi:https://doi.org/10.1007/978-3-642-59992-7_7.
143. Hasselmann, K. (1999). Intertemporal accounting of climate change—Harmonizing economic efficiency and climate stewardship. *Climatic Change*, 41, 333–350. doi:<https://doi.org/10.1023/A:1005441119269>.
144. Hasselmann, K. (1999). Climate change—Linear and nonlinear signatures. *Nature*, 398(6730), 755–756. doi:<https://doi.org/10.1038/19635>.
145. Hasselmann, K. (1999). Climate prediction is heavy weather. *Physics World*, 12, 24.
146. Hasselmann, K. (1999). Modellierung natürlicher und anthropogener Klimaänderungen. *Physikalische Blätter*, 55, 27–30. doi:<https://doi.org/10.1002/phbl.19990550109>.
147. Petschel-Held, G., Schellnhuber, H. J., Bruckner, T., Toth, F. L., & Hasselmann, K. (1999). The tolerable windows approach: Theoretical and methodological foundations. *Climatic Change*, 41, 303–331. doi:<https://doi.org/10.1023/A:1005487123751>.
148. Hasselmann, K. (2000). The outlook for climate change. In H. Siebert, & Institut für Weltwirtschaft an der Universität Kiel (Eds.), *The Economics of International Environmental Problems* (pp. 27–49). Tübingen: Mohr Siebeck.
- 304 H. von Storch**
149. Hasselmann, K. (2001). Optimizing long-term climate management. In E.-D. Schulze, & M. Heimann (Eds.), *Global biogeochemical cycles in the climate system* (pp. 333–343). San Diego: Academic Press. doi:<https://doi.org/10.1016/B978-012631260-7/50029-7>.
150. Hooss, G., Voss, R., Hasselmann, K., Maier-Reimer, E., & Joos, F. (2001). A nonlinear impulse response model of the coupled carbon cycle climate system (NICCS). *Climate Dynamics*, 18(3–4), 189–202. doi:<https://doi.org/10.1007/s003820100170>.
151. Joos, F., Prentice, I. C., Sitch, S., Meyer, R., Hooss, G., Plattner, G.-K., Gerber, S., & Hasselmann, K. (2001). Global warming feedbacks on terrestrial carbon uptake under the Intergovernmental Panel on Climate Change (IPCC) emission scenarios. *Global Biogeochemical Cycles*, 15, 891–907. doi:<https://doi.org/10.1029/2000GB001375>.
152. Hasselmann, K. (2002). Is climate predictable. In A. Bunde, J. Kropp, & J. Schellnhuber (Eds.), *The science of disasters: climate disruption, heart attacks, and market crashes* (pp. 141–169). Berlin: Springer. doi:https://doi.org/10.1007/978-3-642-56257-0_4
153. Johannessen, O., Sagen, H., Hamre, T., Hobaek, H., Hasselmann, K., Maier-Reimer, E., Mikolajewicz, U., Wadhams, P., Kaletzky, A., Bobylev, L., Evert, E., Troyan, V., Naugolnykh, K., & Esipov, I. (2002). Acoustic monitoring of ocean climate in the Arctic (AMOC). In N. C. Flemming, & S. Vallerga et al. (Eds.), *Operational Oceanography—Implementation at the European and regional Scales* (pp. 371–378). Amsterdam: Elsevier Science BV. doi:[https://doi.org/10.1016/S0422-9894\(02\)80043-5](https://doi.org/10.1016/S0422-9894(02)80043-5).
154. Bruckner, T., Hooss, G., Füssel, H.-M., & Hasselmann, K. (2003). Climate system modeling in the framework of the tolerable windows approach: The ICLIPS climate model. *Climatic Change*, 56, 119–137. doi:<https://doi.org/10.1023/A:1021300924356>.
155. Hasselmann, K., Latif, M., Hooss, G., Azar, C., Edenhofer, O., Jaeger, C. C., Johannessen, O. M., Kemfert, C., Welp, M., & Wokaun, A. (2003). The challenge of long-term climate change. *Science*, 302(5652),

- 1923–1925. doi:<https://doi.org/10.1126/science.1090858>.
156. Hasselmann, K., Schellnhuber, H. J., & Edenhofer, O. (2004). Climate change: complexity in action. *PhysicsWorld*, 17, 31–35. doi:<https://doi.org/10.1088/2058-7058/17/6/34>.
157. Hasselmann, K., & Hasselmann, S. (2004). The metron model: a unified deterministic theory of fields and particles—a progress report. In *Proceedings of Institute of Mathematics of NAS of Ukraine* (pp. 788–795). Kyiv: Institute of Mathematics of NAS of Ukraine.
- 5 Statistics 305**
158. Johannsson, O. M., Bengtsson, L., Miles, M. W., Kuzmina, S. I., Semenov, V. A., Alekseev, G. V., Nagurnyi, A. P., Zakharov, V. F., Bobylev, L. P., Pettersson, L. H., Hasselmann, K., & Cattle, A. P. (2004). Arctic climate change: observed and modelled temperature and sea-ice variability. *Tellus Series A-Dynamic Meteorology and Oceanography*, 56 (4), 328–341. doi:<https://doi.org/10.1111/j.1600-0870.2004.00060.x>.
159. Barth, V., & Hasselmann, K. (2005). Analysis of climate damage abatement costs using a dynamic economic model. *Vierteljahrshefte zur Wirtschaftsforschung (DIW)*, 74, 148–163.
160. Schnur, R., & Hasselmann, K. (2005). Optimal filtering for Bayesian detection and attribution of climate change. *Climate Dynamics*, 24 (1), 45–55. doi:<https://doi.org/10.1007/s00382-004-0456-3>.
161. The International Ad Hoc Detection and Attribution Group (2005). Detecting and attributing external influences on the climate system: a review of recent advances. *Journal of Climate*, 18, 1291–1314. doi:<https://doi.org/10.1175/JCLI3329.1>.
162. Weber, M., Barth, V., & Hasselmann, K. (2005). A multiactor dynamic integrated assessment model (MADIAM) of induced technological change and sustainable economic growth. *Ecological Economics*, 54 (2–3), 306–327. doi:<https://doi.org/10.1016/j.ecolecon.2004.12.035>.
163. von Laer, D., Hasselmann, S., & Hasselmann, K. (2006). Gene therapy for HIV infection: what does it need to make it work? *Journal of Gene Medicine*, 8, 658–667. doi:<https://doi.org/10.1002/jgm.908>.
164. von Laer, D., Hasselmann, S., & Hasselmann, K. (2006). Impact of gene-modified T cells on HIV infection dynamics. *Journal of Theoretical Biology*, 238, 60–77. doi:<https://doi.org/10.1016/j.jtbi.2005.05.005>.
165. Hasselmann, K., & Barker, T. (2008). The Stern Review and the IPCC fourth assessment report: implications for interaction between policymakers and climate experts. An editorial essay. *Climatic Change*, 89, 219–229. doi:<https://doi.org/10.1007/s10584-008-9435-8>.
166. Jaeger, C. C., Krause, J., Haas, A., Klein, R., & Hasselmann, K. (2008). A method for computing the fraction of attributable risk related to climate damages. *Risk Analysis*, 28, 815–823. doi:<https://doi.org/10.1111/j.1539-6924.2008.01070.x>.
167. Hasselmann, K. (2009). Simulating human behavior in macroeconomic models applied to climate change. Dahlem Conference “Is there a mathematics of social entities”, Berlin, 14.–19. December 2008. *ECF Working Paper*, 2/2009.
- 306 H. von Storch**
168. Hasselmann, K. (2009). What to do? Does science have a role? *European Physical Journal-Special Topics*, 176, 37–51. doi:<https://doi.org/10.1140/epjst/e2009-01147-x>.

169. Hasselmann, K. (2010). Application of system dynamics to climate policy assessment. In A. Fitt, J. Norbury, H. Ockendon, & E. Wilson (Eds.), *Progress in Industrial Mathematics at ECMI 2008* (pp. 203–208). Berlin: Springer. doi:https://doi.org/10.1007/978-3-642-12110-4_27.
170. Hasselmann, K. (2010). The climate change game. *Nature Geosciences*, 3, 511–512. doi:<https://doi.org/10.1038/ngeo919>.
171. Hasselmann, K., & Voinow, A. (2012). The actor-driven dynamics of decarbonization. In C. C. Jaeger, & et al. (Eds.), *Reframing the problem of climate change* (pp. 131–159). Milton Park: Earthscan. doi:<https://doi.org/10.4324/9780203154724>.
172. Jaeger, C. C., Hasselmann, K., Leipold, G., Mangalagiu, D., & Tabara, J. D. (2012). Conclusion—Action for climate. In C. C. Jaeger, & et al. (Eds.), *Reframing the problem of climate change* (pp. 237–244). Milton Park: Earthscan. doi:<https://doi.org/10.4324/9780203154724>.
173. Jaeger, C. C., Hasselmann, K., Leipold, G., Mangalagiu, D., & Tabara, J. D. (2012). Introduction: Beyond the zero sum game: from shirking burdens to sharing benefits. In C. C. Jaeger, & et al. (Eds.), *Reframing the problem of climate change* (pp. 1–14). Milton Park: Earthscan. doi:<https://doi.org/10.4324/9780203154724>.
174. Giupponi, C., Borsuk, M., de Vries, B., & Hasselmann, K. (2013). Innovative approaches to integrated global change modelling. *Environmental Modelling and Software*, 44, 1–9. doi:<https://doi.org/10.1016/j.envsoft.2013.01.013>.
175. Hasselmann, K., & Kovalevsky, D. V. (2013). Simulating animal spirits in actor-based environmental models. *Environmental Modelling and Software*, 44, 10–24. doi:<https://doi.org/10.1016/j.envsoft.2012.04.007>.
176. Hasselmann, K., Chapron, B., Aouf, L., Arduin, F., Collard, F., Engen, G., Hasselmann, S., Heimbach, P., Janssen, P., Johnsen, H., Krogstad, H., Lehner, S., Li, J.-G., Li, X.-M., Rosenthal, W., & Schulz-Stellenfleth, J. (2013). The ERS SAR wave mode: A breakthrough in global ocean wave observations. In Y. Desnos (Ed.), *ERS Missions: 20 Years of Observing the Earth* (pp. 167–197). Noordwijk: ESA/ESTEC.
177. Hasselmann, K. (2013). A classical path to unification. *Journal of Physics Conference Series*, 437 : 012,023. doi:<https://doi.org/10.1088/1742-6596/437/1/012023>.
- 5 Statistics 307**
178. Hasselmann, K. (2013). Ernst Maier-Reimer: The discovery of silence. *Nature Geoscience*, 8(10), 809–809. doi:<https://doi.org/10.1038/ngeo1953>.
179. Hasselmann, K. (2013). Detecting and responding to climate change. *Tellus, Series B—Chemical and Physical Meteorology*, 65: 20,088. doi:<https://doi.org/10.3402/tellusb.v65i0.20088>.
180. Kovalevsky, D., & Hasselmann, K. (2014). A hierarchy of out-of-equilibrium actor-based system-dynamic nonlinear economic models. *Discontinuity, Nonlinearity, and Complexity*, 3, 303–318. doi:<https://doi.org/10.5890/DNC.2014.09.007>
181. Kovalevsky, D., & Hasselmann, K. (2014). Assessing the transition to a low-carbon economy using actor-based system-dynamic models. In *Proceedings—7th International Congress on Environmental Modelling and Software, iEMSS 2014* (pp. 1865–1872).
182. Kovalevsky, D. V., & Hasselmann, K. (2014). Modelling the impacts of a national carbon tax in a country with inhomogeneous regional

- development: an actor-based system-dynamic approach. In *ERSA 54th Congress "Regional development & globalisation: Best practices", 26–29 August 2014, St. Petersburg, Russia*. Louvain-la-Neuve: European Regional Science Association (ERSA).
183. Hasselmann, K., Cremades, R., Filatova, T., Hewitt, R., Jaeger, C., Kovalevsky, D., Voinov, A., & Winder, N. (2015). Free-riders to forerunners. *Nature Geoscience*, 8, 895–898. doi:<https://doi.org/10.1038/ngeo2593>.
184. Kovalevsky, D. V., & Hasselmann, K. (2016). Actor-based system dynamics modelling of win-win climate mitigation options. In *The 8th International Congress on Environmental Modelling and Software (iEMSS 2016), 10–14 July 2016, Toulouse, France*.
185. Kovalevsky, D., Hewitt, R., de Boer, C., & Hasselmann, K. (2017). A dynamic systems approach to the representation of policy implementation processes in a multi-actor world. *Discontinuity, Nonlinearity, and Complexity*, 6, 219–245. doi:<https://doi.org/10.5890/DNC.2017.09.001>.
186. Heinze, C., & Hasselmann, K. (2019). Preface: Ernst Maier-Reimer and his way of modelling the ocean. *Biogeosciences*, 16 (Spec. Iss.: Progress in quantifying ocean biogeochemistry – in honour of Ernst Maier-Reimer), 751–753. doi:<https://doi.org/10.5194/bg-16-751-2019>.
- 308 H. von Storch**
187. Pettersson, L. H., Kjelaas, A. G., Kovalevsky, D. V., & Hasselmann, K. (2020). Climate change impact on the Arctic economy. In O. M. Johannessen, L. P. Bobylev, E. V. Shalina, & S. Sandven (Eds.), *Sea Ice in the Arctic: Past, Present and Future* (pp. 465–506). Cham: Springer International Publishing. doi:https://doi.org/10.1007/978-3-030-21301-5_11.
188. Hewitt, R., Cremades, R., Kovalevsky, D., & Hasselmann, K. (2021). Beyond shared socioeconomic pathways (SSPs) and representative concentration pathways (RCPs): climate policy implementation scenarios for Europe, the US and China. *Climate Policy*, 21, 434–454. doi:<https://doi.org/10.1080/14693062.2020.1852068>.
- Other Publications and Grey Literature**
189. Hasselmann, K. (1955). Über die Trägheitskräfte der isotropen Turbulenz. Diploma Thesis, Technische Universität Hamburg. doi:<https://doi.org/10.15480/882.516>.
190. Hasselmann, K. (1955). Potentialtheoretische Druckverteilung an einigen drehsymmetrischen Halbkörpern. *Schriftenreihe Schiffbau*, 29. doi:<https://doi.org/10.15480/882.526>.
191. Hasselmann, K. (1957). Über eine Methode zur Bestimmung der Reflexion und Brechung von Stoßfronten und von beliebigen Wellen kleiner Wellenlängen an der Trennungsfläche zweier Medien. PhD Thesis, Universität Göttingen, Göttingen.
192. Hasselmann, K. (1958). Zur Deutung der dreifachen Geschwindigkeitskorrelationen der isotropen Turbulenz. *Schriftenreihe Schiffbau*, 84. doi:<https://doi.org/10.15480/882.558>.
193. Hasselmann, K. (1960). Decay of wave-induced velocity fluctuations in the small HSVA Tank. *Schriftenreihe Schiffbau*, 66. doi:<https://doi.org/10.15480/882.554>.
194. Hasselmann, K. (1960). Über den Einfluß nichtlinearer Wechselwirkungen auf die Energieverteilung in einem Seegangsspektrum.

Schriftenreihe Schiffbau, 81. doi:<https://doi.org/10.15480/882.779>.

195. Hasselmann, K. (1961). Interpretation of Phillips' wave growth mechanism. [In *Ocean wave spectra: Proceedings of a conference*] (pp. nicht im Konferenzband 1963 enthalten).

196. Hasselmann, K. (1970). Der Sonnenwind. Jahrbuch der Akademie der Wissenschaften in Göttingen, 22–25.

5 Statistics 309

197. Sell, W., & Hasselmann, K. (1972). *Computations of nonlinear energy transfer for JONSWAP and empirical wind wave spectra*. Hamburg:

Institut für Geophysik, Universität Hamburg.

198. Hasselmann, K. (1977). The dynamical coupling between the atmosphere and the ocean. In *The influence of the ocean on climate* (pp. 31–44). Genf: WMO. (Reports on marine science affairs; 11)

199. Hasselmann, K. (1980). Klimamodelle. *Annalen der Meteorologie, N.F.* 15, 81–82

200. Hasselmann, S., & Hasselmann, K. (1981). A symmetrical method of computing the nonlinear transfer in a gravity wave spectrum.

Hamburger Geophysikalische Einzelschriften: Reihe A, Wissenschaftliche Abhandlungen, 52.

201. Maier-Reimer, E., Müller, D., Olbers, D., Willebrand, J., & Hasselmann, K. (1982). *An ocean circulation model for climate variability studies*. Hamburg: Max-Planck-Institut für Meteorologie.

202. Maier-Reimer, E., Müller, D., Olbers, D., Willebrand, J., & Hasselmann, K. (1982). *Ein Modell der ozeanischen Zirkulation zur Untersuchung von Klimaschwankungen*. Hamburg: Max-Planck-Institut für Meteorologie.

203. Young, I. R., Hasselmann, S., & Hasselmann, K. (1985). Calculation of the nonlinear wave-wave interactions in cross seas. *Hamburger Geophysikalische Einzelschriften—Reihe A: Wissenschaftliche Abhandlungen*, 74.

204. Hasselmann, K., Hasselmann, S., Bauer, E., Brüning, C., Lehner, S., Gruber, H., & Lionello, P. (1988). Development of a Satellite SAR Image Spectra and Altimeter Wave Height Data Assimilation System for ERS-1. *Report/Max-Planck-Institute for Meteorology*, 019. doi:<https://doi.org/10.17617/2.2578369>.

205. Oberhuber, J., & Hasselmann, K. (1988). Ozeanmodelle. Promet, 18 (Nos. 1–3—Das Max-Planck-Institut für Meteorologie), 14–21

206. Hasselmann, K., Hasselmann, S., & Barthel, K. (1990). European Space Agency Contract Report use of a wave model as a validation tool for ERS-1 AMI Wave products and as an input for the ERS-1 Wind Retrieval Algorithms. *Report/Max-Planck-Institut für Meteorologie*, 055. doi:<https://doi.org/10.17617/2.2556396>.

207. Latif, M. (Ed.). (1991). Strategies for future climate research: A collection of papers presented at the birthday colloquium in honour of Klaus Hasselmann's 60th anniversary. Hamburg: Max-Planck-Institut für Meteorologie.

310 H. von Storch

208. Hasselmann, K. (1993). Das Klimamodell: zu den Grundlagen des Klimasystems. In Ruprecht-Karls-Universität Heidelberg (Ed.), *Klima: Vorträge im Wintersemester 1992/93 [Sammelband der Vorträge des Studium Generale]* (pp. 9–29). Heidelberg: Heidelberger Verl.-Anst.

209. Hasselmann, K., Sell, W., Blum, W., & Thierbach, D. (1994). *Deutsches Klimarechenzentrum*. Hamburg: DKRZ.

210. Hasselmann, K., Bengtsson, L., Cubasch, U., Hegerl, G. C., Rodhe, H., Roeckner, E., von Storch, H., Voss, R., & Waszkewitz, J. (1995). Detection of anthropogenic climate change using a fingerprint method. *Report/Max-Planck-Institut für Meteorologie*, 168. doi:<https://doi.org/10.17617/2.2534307>.
211. Santer, B. D., Cubasch, U., Hasselmann, K., Brüggemann, W., Höck, H., Maier-Reimer, E., & Mikolajewicz, U. (1995). Selecting components of a greenhouse-gas fingerprint. In *Global change: Proceedings of the first Demetra meeting held at Chianciano Terme, Italy from 28 to 31 October 1991* (pp. 164–183). Luxemburg: Office for Official Publications of the European Community.
212. Hasselmann, K. (1996). Optimierte Klimaschutzstrategien. In *Klima—Umwelt—Gesellschaft: ein interdisziplinäres Seminar der Universität Hamburg am 16./17. November 1995 im Haus Rissen* (pp. 9–23). Hamburg: Universität Hamburg.
213. Heimbach, P., Hasselmann, S., Brüning, C., & Hasselmann, K. (1996). Application of wave spectral retrievals from ERS-1 wave mode data for improved wind and wave field analyses. In *Proceedings of the Second ERS Applications workshop* (pp. 303–308). Noordwijk: ESA/ESTAC.
214. Czakainski, M., & Hasselmann, K. (1997). Klimaforschung im Kreuzfeuer der Interessen: Interview mit Prof. Dr. Klaus Hasselmann. *Energiewirtschaftliche Tagesfragen: ET*, 47, 568–574.
215. Hasselmann, K. (1997). Die Launen der Medien: eine Antwort auf die Kritik an der Klimaforschung. *Die ZEIT*, (32/1997)
216. Hasselmann, S., Bennefeld, C., Hasselmann, K., Graber, H., Jackson, F. C., Hauser, D., Vachon, P. W., Walsh, E. J., & Long, R. B. (1998). Intercomparison of two-dimensional wave spectra obtained from microwave instruments, buoys and WAModel simulations during the surface wave dynamics experiment. *Report/Max-Planck-Institut für Meteorologie*, 258. doi:<https://doi.org/10.17617/2.3185922>.
- 5 Statistics 311**
217. Tett, S., Mitchell, J., Hasselmann, K., & Komen, G. (1998). Attribution beyond discernible—Workshop aims. In S. Tett, & et al. (Eds.), *Attribution: Beyond discernible. Euroclivar Workshop on Climate Change Detection and Attribution (Report Eucliv; 10)* (pp. 31–41)
218. Hasselmann, K. (2000). (Über)Leben auf dem Raumschiff Erde. In H. Adamski (Ed.), *Der Gott der Fakultäten* (pp. 181–202). Münster: Lit.
219. Hasselmann, K., Lehner, S., & Schulz-Stellenfleth, J. (2000). *FEME ESA Report: ERS SAR Observations of ocean waves in the marginal ice zone*.
220. Johannessen, O. M., Sandven, S., Sagen, H., Hamre, T., Haugen, V. J., Wadhams, P., Kaletzky, A., Davis, N. R., Hasselmann, K., Maier-Reimer, E., Mikolajewicz, U., Soldatov, V., Bobylev, L., Esipov, I. B., Evert, E., & Naugolnykh, K. A. (2001). Acoustic Monitoring of the Ocean Climate in the Arctic Ocean (AMOC): Final Report. *NERSC Technical Report*, 198.
221. Hasselmann, K. (2002). Der Kyoto-Prozess zum Klimaschutz: Hintergründe und Entwicklungsoptionen aus Sicht der Klimaforschung. In *Kraft-Wärme-Kopplung als Beitrag zu Klimaschutz und Energieeinsparung* (pp. 7–16). Braunschweig: Cramer.
222. Welp, M., Hasselmann, K., & Jaeger, C. C. (2003). Climate change and paths to sustainability: the role of science based stakeholder dialogues. *Reference Magazine*, 19, 8–13.

223. Kovalevsky, D., & Hasselmann, K. (2013). Out-of-equilibrium actorbased system-dynamic modeling of the economics of climate change. In *GSS Preparatory Workshop for the 3rd Open Global Systems Science Conference (2014)*. Beijing, China.
224. Arto, I., Capellán-Pérez, I., Filatova, T., González-Eguinob, M., Hasselmann, K., Kovalevsky, D. V., Markandya, A., Moghayer, S. M., & Tariku, M. B. (2014). Review of existing literature on methodologies to model non-linearity, thresholds and irreversibility in high-impact climate change events in the presence of environmental tipping points. *EU FP7 COMPLEX Report, D5.2*.
225. Filatova, T., Moghayer, S., Arto, I., Belete, G. F., Dhavala, K., Hasselmann, K., Kovalevsky, D. V., Niamir, L., Bulavskaya, T., & Voinov, A. (2014). Dynamics of climate-energy-economy systems: development of a methodological framework for an integrated system of models. *EU FP7 COMPLEX Report, D5.3*.
- 312 H. von Storch**
226. Moghayer, S., Capellán-Pérez, I., Arto, I., Markandya, A., González-Eguino, M., Flatova, T., Pinouche, F., Chahim, M., Kovalevsky, D., & Hasselmann, K. (2013). State of the art review of climate-energyeconomic modeling approaches. *EU FP7 COMPLEX Report, D5.1*.
227. von Storch, H., Barkhordarian, A., Hasselmann, K., & Zorita, E. (2013). Can climate models explain the recent stagnation in global warming? http://academia.edu/4210419/Can_climate_models_explain_the_recent_stagnation_in_global_warming
228. Kovalevsky, D., Arto, I., Dhavala, K., Filatova, T., Hasselmann, K., Moghayer, S. M., Niamir, L., & Voinov, A. (2015). Report on integration of climate scenarios in the modeling system. *EU FP7 COMPLEX Report, D5.4*.
229. Arto, I., Boonman, H., Capellán-Pérez, I., Husby, T. G., Filatova, T., González-Eguinob, M., Hasselmann, K., Kovalevsky, D., Markandya, A., Moghayer, S. M., Niamir, L., Tariku, M. B., & Voinov, A. (2016). Coupled environment-ecology models. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 81–108). Sigtuna, Sweden: Sigtunastiftelsen.
230. Arto, I., Boonman, H., Capellán-Pérez, I., Husby, T. G., Filatova, T., González-Eguinob, M., Hasselmann, K., Kovalevsky, D., Markandya, A., Moghayer, S. M., Niamir, L., Tariku, M. B., & Voinov, A. (2016). Climate mitigation policies. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 67–80). Sigtuna, Sweden: Sigtunastiftelsen.
231. Arto, I., Boonman, H., Capellán-Pérez, I., Husby, T. G., Filatova, T., González-Eguinob, M., Hasselmann, K., Kovalevsky, D., Markandya, A., Moghayer, S. M., Niamir, L., Tariku, M. B., & Voinov, A. (2016). Lake system. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 55–66). Sigtuna, Sweden: Sigtunastiftelsen.
232. Arto, I., Capellán-Pérez, I., Filatova, T., González-Eguinob, M., Hasselmann, K., Kovalevsky, D., Markandya, A., Moghayer, S. M., & Tariku, M. B. (2016). Socio-ecological system. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 49–54). Sigtuna, Sweden: Sigtunastiftelsen.

5 Statistics 313

233. Arto, I., Capellán-Pérez, I., Filatova, T., Gonzá-lez-Eguinob, M., Hasselmann, K., Kovalevsky, D., Markandy, A., Moghayer, S. M., & Tariku, M. B. (2016). The climate system. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 43–48). Sigtuna, Sweden: Sigtunastiftelsen.
234. Arto, I., Capellán-Pérez, I., Filatova, T., Gonzá-lez-Eguinob, M., Hasselmann, K., Kovalevsky, D., Markandy, A., Moghayer, S. M., & Tariku, M. B. (2016). Definitions. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 39–42). Sigtuna, Sweden: Sigtunastiftelsen.
235. Hasselmann, K., & Kovalevsky, D. (2016). A hierarchy of out-of-equilibrium actor-based system-dynamic nonlinear economic models. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and System-Flips* (pp. 109–117). Sigtuna, Sweden: Sigtunastiftelsen.
236. Kovalevsky, D., & Hasselmann, K. (2016). Actor-based system dynamics modelling of abrupt climate change scenarios. In N. Winder, & H. Liljenström (Eds.), *EU FP7 COMPLEX Final Scientific Report, Vol. 2: Non-linearities and system-flips* (pp. 118–127). Sigtuna, Sweden: Sigtunastiftelsen.
237. Kovalevskiy, D., Shchiptsova, A., Rovenskaya, E., & Hasselmann, K. (2016). Narrowing uncertainty of projections of the global economyclimate system dynamics via mutually compatible integration within multi-model ensembles. *IIASA Working Paper, WP-16-015*
238. Hasselmann, K. (2017). 12 Fragen An. 12 Questions to. *Gaia-Ecological Perspectives for Science and Society*, 26, 4–5. doi:<https://doi.org/10.14512/gaia.26.1.2>

239. Hewitt, R., Hasselmann, K., Kovalevsky, D. V., & Cremades, R. (2019). The transformative role of actor interactions: new approaches to the climate policy narrative. In *The 11th International Social Innovation Research Conference (ISIRC 2019)—ISIRC Abstract Booklet*. Glasgow, UK.

Books

240. Favre, A., & Hasselmann, K. (Eds.). (1978). Turbulent fluxes through the sea surface, wave dynamics, and prediction. Berlin u.a.: Springer-Verlag. doi:<https://doi.org/10.1007/978-1-4612-9806-9>.

314 H. von Storch

241. Hunt, J. J., Bengtsson, L., Bolle, H.-J., Gudmandsen, P., Hasselmann, K., Houghton, J., & Morel, P. (Eds.). (1985). The use of satellite data in climate models: Proceedings of a conference held in Alpach, Austria, 10–12 June 1985. Noordwijk: ESA Scientific & Technical Publications Branch.
242. The SWAMP Group (1985). Ocean wave modeling. New York: Plenum Publ. Corp. doi:<https://doi.org/10.1007/978-1-4757-6055-2>.
243. Phillips, O. M., & Hasselmann, K. (Eds.). (1986). Wave dynamics and radio probing of the ocean surface. New York: Plenum Press. doi:<https://doi.org/10.1007/978-1-4684-8980-4>.
244. Komen, G., Cavalieri, L., Donelan, M., Hasselmann, K., Hasselmann, S., & Janssen, P. (Eds.). (1996). Dynamics and modelling of ocean waves. Cambridge: Cambridge Univ. Press. doi:<https://doi.org/10.1017/CBO9780511628955>.
245. von Storch, H., & Hasselmann, K. (2010). Seventy years of exploration

in oceanography: A prolonged weekend discussion with Walter Munk.
Berlin u.a.: Springer. doi:<https://doi.org/10.1007/978-3-642-12087-9>.
246. Jaeger, C., Hasselmann, K., Leipold, G., Mangalagiu, D., & Tàbara, J. (Eds.). (2012). Reframing the problem of climate change: From zero sum game to win-win solutions. Milton Park: Earthscan. doi:<https://doi.org/10.4324/9780203154724>.

5.3 Awards

January 1963: Carl Christiansen Commemorative Award.
April 1964: James B. Macelwane Award of the American Geophysical Union.
November 1970: Academic Award for Physics from the Academy of Sciences in Göttingen.
January 1971: Sverdrup Medal of the American Meteorological Union.
December 1981: Belfotop-Eurosense Award of the Remote Sensing Society.
April 1990: Robertson Memorial Lecture Award of the US National Academy of Sciences.
September 1990: Förderpreis für die Europäische Wissenschaft of the Körber-Stiftung, Hamburg.
June 1993: Nansen Polar Bear Award, Bergen, Norway.
December 1994: Oceanography Award sponsored by the Society for Underwater Technology, Portland, UK.
March 1996: Oceanology International Lifetime Achievement Award.
October 1996: Premio Italgas per la Ricerca e L'Innovazione 1996.

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May 1997: Symons Memorial Medal of the Royal Meteorological Society.
November 1998: Umweltpreis 1998 der Deutschen Bundesstiftung Umwelt.
May 1999: Karl-Küpfmüller-Ring der Technischen Universität Darmstadt.
July 2000: Dr. honoris causa, University of East Anglia.
April 2002: Vilhelm Bjerknes Medal of the European Geophysical Society.
November 2005: Gold medal of the University of Alcalá, Spain. <https://www.nobelprize.org/prizes/physics/2021/summary>.
2007: achievement award of the International Meeting of Statistical Climatology
2009: BBVA Frontiers of Science Award
2021: Nobel Prize in Physics

