

VITA

AKIRA KASAHARA, Born Tokyo, Japan, 11 October 1926; U.S. citizen.

EDUCATION

- B.S. Faculty of Science, University of Tokyo, 1948
- M.S. Geophysical Institute, University of Tokyo, 1950
- D.Sc. Geophysical Institute, University of Tokyo, 1954

RESEARCH APPOINTMENTS

Senior Research Associate, National Center for Atmospheric Research, 1996 - present.

Senior Scientist, National Center for Atmospheric Research, 1974 - 1996.

Head, Global Dynamics Section, Climate and Global Dynamics Division, National Center for Atmospheric Research, 1987-1992.

Head, Large-Scale Dynamics Section, Atmospheric Analysis and Prediction Division, National Center for Atmospheric Research, 1978-1987.

Head, UCAR Visiting Scientist Program, University Corporation for Atmospheric Research. On collaborative leave at the National Meteorological Center, January-December 1986.

Acting Head, Global Atmospheric Research Program, National Center for Atmospheric Research, 1973-1974.

Program Scientist, National Center for Atmospheric Research, 1963-1973.

Research Scientist, Courant Institute of Mathematical Sciences, New York University, 1962-1963.

Research Associate, Department of Meteorology, University of Chicago, 1956-1962.

Research Associate, Department of Oceanography and Meteorology, Texas A&M University, 1954-1956.

Research Associate, Geophysical Institute, University of Tokyo, 1953-1954.

Research Assistant, Geophysical Institute, University of Tokyo, 1948-1953.

ACADEMIC APPOINTMENTS

Affiliate Professor of Meteorology, Department of Meteorology, Texas A&M University, 1966-1968. Taught a course on dynamic meteorology during fall semester of 1967.

Visiting Research Scientist and Lecturer, Institute of Meteorology, University of Stockholm, Sweden, September 1971-June 1972.

Visiting Professor, Geophysical Institute, University of Tokyo, September 1975-January 1976. Taught a course on spectral methods in meteorology.

External Examiner, Department of Meteorology, University of Nairobi, Kenya, 1977-1979.

Adjunct Professor of Meteorology, Department of Meteorology, University of Utah, 1979-present. Taught a course on advanced dynamics during fall semester of 1982.

Visiting Professor, Department of Atmospheric Science, Taiwan National University, August 1986. Taught Part 1 of a course on climate analysis and modeling, focusing on dynamical aspects.

Visiting Lecturer, Institute of Space Research (INPE), Sao Jose dos Campos, Brazil, August 1987. Taught a course on advanced numerical weather prediction.

THESIS COMMITTEES

Ph.D. for Nicholas Lordi, Department of Meteorology, University of Utah, 1978.

Ph.D. for Pedro Silva Dias, Department of Atmospheric Sciences, Colorado State University, 1979.

Ph.D. for James Koermer, Department of Meteorology, University of Utah, 1980.

Ph.D. for Frederick H. M. Semazzi, Department of Meteorology, University of Nairobi, Kenya, 1983.

Ph.D. for Yongkang Xue, Department of Meteorology, University of Utah, 1987.

Ph.D. for Muyin Wang, Department of Meteorology, University of Utah, 1995.

HONORS

Japan Meteorological Society Award (1961).

National Center for Atmospheric Research Publication Award (1969), Honorable Mention.

Fellow, American Meteorological Society, 1972.

Fellow, American Association for the Advancement of Science, 1993

Japanese Government Research Award for Foreign Specialists from the Science and Technology Agency, 1988.

Fujiwara Award, Japan Meteorological Society, 1996.

Honorary Member, Japan Meteorological Society, 1998.

EDITORIAL BOARDS

Associate Editor, *Journal of Applied Meteorology*, American Meteorological Society, 1967-1972.

Editor, Volume 2, *Numerical Methods Used in Atmospheric Models*, GARP Publication Series.

Advisory Editor, *Papers in Meteorological Research*, Meteorological Society of the Republic of China, 1984.

Editorial Board Member, *The Brazilian Journal of Meteorology*, 1986.

NCAR COMMITTEES

Advisory Panel for Computing Facility, 1967-1970.

Ad Hoc Committee on Physical and Dynamical Bases for Predicting Climate Change, 1973.

Interim Appointments Committee, 1973.

Global Atmospheric Research Programme Coordinating Council, 1973-1974.

Atmospheric Analysis and Prediction Division Personnel Committee, Steering Committee, 1974-1987.

General Circulation Model Steering Committee, 1974-1980.

Outstanding Publication Award Selection Committee, 1978, 1987, 1993.

Senior Review Committee, 1977-1980.

CCM Coordinating Committee, 1981-1993.

Committee to select the Director of the Climate and Global Dynamics Division, 1987.

Appointments Review Group (ARG), 1987-1991.

Investigative subcommittees of ARG: 1992, 1993, 1994, 1995 (Chair)

CCM Workshop Advisory Committee for 1990 Workshop.

Member, CGD Division Equity Committee, 1993-1996.

Member, CGD Senior Scientist Advisory Committee, 1987-1996.

NON-NCAR COMMITTEES

Advisory Committee on Hurricanes and Tropical Meteorology, American Meteorological Society, 1962-1965.

Advisory Committee of the University of Illinois for Establishing a Meteorological Laboratory, 1967.

Ad Hoc Review Committee for Federal Government Plan for GARP, December 1969.

EOLE Data Interpretation Group (EDIG), NASA, Goddard Space Flight Center, Greenbelt, Maryland (W. R. Bandeen), 1970-1972.

Joint Organizing Committee (JOC) Working Group on Numerical Experimentation, Research Coordination and Planning Group on Real-Time Processing, 1970-1972.

Group No.4, Prediction and Simulation, JOC Working Group on Numerical Experimentation, 1972-74.

Climate Impact Assessment Program, Panel on the Natural Stratosphere, Department of Transport, 1974.

First Planning Meeting for the GARP Sub-Programme on Air-Flow Over and Around Mountains, 1977.

AMS Committee on Weather Forecasting and Analysis, 1981-83.

Mountain Subprogram Panel, U.S. Committee for the GARP, National Research Council, 1980-1985.

Technical Committee, Model Evaluation Consortium for Climate Assessment (MECCA), 1991-1995.

NPOESS (Next-generation Polar-Orbiting Operational Environmental Satellite System) Observing System Simulation Experiments Advisory Committee, 1997-present.

PUBLICATIONS BY AKIRA KASAHARA

Refereed Articles

1. Syōno, S., Y. Ogura, K. Gambo, and A. Kasahara, 1951: On the negative vorticity in a typhoon. *J. Meteor. Soc. Japan*, **29**, 12, 397-415.
2. Gambo, K., and A. Kasahara, 1952: Notes on the motion of a rotating solid cylinder on a rotating earth. *J. Meteor. Soc. Japan*, **30**, 4, 119-125.
3. Syōno, S., K. Gambo, and A. Kasahara, 1952: The high tropospheric jet stream. *Kagaku (Science)*, Tokyo, **22**, 5, 226-236 (in Japanese).
4. Kasahara, A., 1952: The structure of a tropical cyclone in the incipient stage. *Geophys. Magazine*, Central Meteorological Observatory, Tokyo, **24**, 2, 129-154.
5. Kasahara, A., 1953: A note on the vertical structure of the pressure and temperature fields in a typhoon. *J. Meteor. Soc. Japan*, **31**, 1, 22-35.
6. Kasahara, A., 1954: Supplementary notes on the formation and the schematic structure of typhoons. *J. Meteor. Soc. Japan*, **32**, 2, 31-51.
7. Syōno, S., A. Kasahara, and Y. Sekiguchi, 1954: Some statistical properties of the atmospheric disturbance on the 500 mb level. *J. Meteor. Soc. Japan*, **33**, 1, 23-30.
8. Kasahara, A., and Y. Masuda, 1956: *Typhoon-A tropical cyclone*. Tokyo, Chijin-Shokan, 138 pp. (A textbook written in Japanese in a series of meteorological handbooks published by Chijin book publisher.)
9. Kasahara, A., 1957: The numerical prediction of hurricane movement with barotropic model. *J. Meteor.*, **14**, 5, 386-402.
10. Kasahara, A., 1959: A comparison between geostrophic and nongeostrophic numerical forecasts of hurricane movement with the barotropic steering model. *J. Meteor.*, **16**, 371-384.
11. Kasahara, A., 1960: The numerical prediction of hurricane movement with a two-level baroclinic model. *J. Meteor.*, **17**, 357-370.
12. Kasahara, A., 1961a: A numerical experiment on the development of a tropical cyclone. *J. Meteor.*, **18**, 259-282.
13. Kasahara, A., 1961b: The development of a forced convection caused by the released latent heat of condensation in the hydrostatic atmosphere. *Proc. International Symp. Numer. Wea. Pred.*, Meteorological Society of Japan, 387-401.
14. Kasahara, A., and G. W. Platzman, 1963: Interaction of a hurricane with the steering flow and its effect upon the hurricane trajectory. *Tellus*, **15**, 321-335.
15. Kasahara, A., and G. W. Platzman, 1964: An error estimate for numerical prediction of hurricane trajectories. *J. Appl. Meteor.*, **31**, 1, 110-111.
16. Kasahara, A., 1964a: A key problem in the numerical model of tropical cyclone. *Geofisica Internacional*, **4**, 4, 179-186.
17. Kasahara, A., 1964b: A numerical model of tropical cyclones. *Proc. Symp. Tropical Meteor.*, New Zealand Meteor. Service, 650-659.

18. Kasahara, A., 1965: On certain finite-difference methods for fluid dynamics. *Mon. Wea. Rev.*, **93**, 27-31.
19. Kasahara, A., E. Isaacson, and J. J. Stoker, 1965: Numerical studies of frontal motion in the atmosphere-I. *Tellus*, **17**, 261-276.
20. Houghton, D., A. Kasahara, and W. Washington, 1966: Long term integration of the barotropic equations by the Lax-Wendroff method. *Mon. Wea. Rev.*, **94**, 1411-150.
21. Kasahara, A., 1966: The dynamical influence of orography on the large-scale motion of the atmosphere. *J. Atmos. Sci.*, **23**, 3, 259-271.
22. Kasahara, A., 1967: Numerical computations of the barotropic flow over a large-scale mountain. *Proc. International Symp. Dynamics of Large-scale Processes in Atmos.*, Moscow, USSR, 269-277.
23. Kasahara, A., and W. M. Washington, 1967: NCAR global general circulation model of the atmosphere. *Mon. Wea. Rev.*, **95**, 7, 389-402.
24. Kasahara, A., and T. Asai, 1967: Effects of an ensemble of convective elements on the large-scale motions of the atmosphere. *J. Meteor. Soc. Japan*, **45**, 4, 280-291.
25. Asai, T., and A. Kasahara, 1967: A theoretical study of the compensating downward motions associated with cumulus clouds. *J. Atmos. Sci.*, **24**, 5, 487-496.
26. Kasahara, A., 1968a: The influence of orography on the global circulation patterns of the atmosphere. *Proc. Symp. Mountain Meteor.*, Fort Collins, Colorado, 193-221.
27. Kasahara, A., 1968b: Computer experiments in the global circulation of the earth's atmosphere. *Proc. Fall Joint Computer Conf.*, AFIPS, Vol. 33, Thompson Book Co., 1259-1272.
28. Houghton, D. D., and A. Kasahara, 1968: Nonlinear shallow fluid flow over an isolated ridge. *Comm. Pure Appl. Math.*, **21**, 1-23.
29. Kasahara, A., 1969: Simulation of the earth's atmosphere. In *Computational Approaches in Applied Mechanics* (E. Sevin, Ed.), American Society of Mechanical Engineering, 210-229.
30. Kasahara, A., and W. M. Washington, 1969: Thermal and dynamical effects of orography on the general circulation of the atmosphere. *Proc. WMO/IUGG Symp. Numer. Wea. Pred.*, Tokyo, Japan, IV-47-56.
31. Kasahara, A., and D. D. Houghton, 1969: An example of non unique, discontinuous solutions in fluid dynamics. *J. Comp. Phys.*, **4**, 3, 377-388.
32. Washington, W. M., and A. Kasahara, 1970: A January simulation experiment with the two-layer version of the NCAR global circulation model. *Mon. Wea. Rev.*, **98**, 8, 559-580.
33. Kasahara, A., 1971a: Computer simulations of the global circulation of the earth's atmosphere. In *Computers and Their Role in Science* (S. Fernbach, Ed.), Gordon and Breach, New York, Chapter 23, 571-594.
34. Kasahara, A., 1971b: Computer simulation of the earth's atmosphere. *Proc. Section on Numer. Methods in Gasdynamics of the Second International Colloq. Gasdynamics of Explosion and Reacting Systems*, Novosibirsk, USSR, 202-217.
35. Wellck, R. E., A. Kasahara, W. M. Washington, and G. DeSanto, 1971: Effect of horizontal resolution in a finite-difference model of the general circulation. *Mon. Wea. Rev.*, **99**, 9, 673-683.
36. Kasahara, A., and W. M. Washington, 1971: General circulation experiments with a six-layer NCAR model including orography, cloudiness and surface temperature calculations. *J. Atmos. Sci.*, **28**, 5, 657-701.

37. Kasahara, A., 1971: Mean and eddy transports of angular momentum, water vapor, and energy in the global atmosphere. *J. Meteor. Soc. Japan*, 49 (Special Issue, Syōno Memorial Volume), 573-594.
38. Williamson, D., and A. Kasahara, 1971: Adaptation of meteorological variables forced by updating. *J. Atmos. Sci.*, **28**, 8, 1313-1324.
39. Kasahara, A., 1972: Simulation experiments for meteorological observing systems for GARP. *Bull. Amer. Meteor. Soc.*, **53**, 3, 252-264.
40. Kasahara, A., and D. Williamson, 1972: Evaluation of tropical wind and reference pressure measurements: Numerical experiments for observing systems. *Tellus*, **24**, 2, 1001-15.
41. Kasahara, A., and D. B. Rao, 1972: Instability of frontal motions in the atmosphere. *J. Atmos. Sci.*, **29**, 6, 1090-1108.
42. Kasahara, A., 1973: Review of *Weather Forecasting as a Problem in Physics* by A. S. Monin, MIT Press, Trans. Amer. Geophys. Union, EOS, **54**(6), 639-642.
43. Kasahara, A., T. Sasamori, and W. M. Washington, 1973: Simulation experiments with a 12-layer stratospheric global circulation model. I. Dynamical effect of the earth's orography and thermal influence of continentality. *J. Atmos. Sci.*, **30**, 1229-1251.
44. Kasahara, A., 1974: Various vertical coordinate systems used for numerical weather prediction. *Mon. Wea. Rev.*, **102**, 7, 509-522.
45. Kasahara, A. and T. Sasamori, 1974: Simulation experiments with a 12-layer stratospheric global circulation model. II. Momentum balance and energetics in the stratosphere. *J. Atmos. Sci.*, **31**, 2, 408-421.
46. Kasahara, A., 1976a: Normal modes of ultralong waves in the atmosphere. *Mon. Wea. Rev.*, **104**, 6, 669-690.
47. Kasahara, A., 1976b: Application of Hough harmonics to a spectral barotropic primitive equation global model. *Annalen der Meteorologie (Neue Folge)*, **11**, 177-180.
48. Kasahara, A., 1977a: Numerical integration of the global barotropic primitive equations with Hough harmonic expansions. *J. Atmos. Sci.*, **34**, 5, 687-701.
49. Kasahara, A., 1977b: Computational aspects of numerical models for weather prediction and climate simulation. In *Methods in Computational Physics* (J. Chang, Ed.), Academic Press, New York, Vol. 17, 1-66.
50. Kasahara, A., 1977c: A spectral model of atmospheric prediction equations over a sphere with eigenfunction expansions. *Computing Methods in Geophysical Mechanics*, American Society of Mechanical Engineers, AMD, Vol. 25 (Library of Congress Catalog Number 77-087327), 93-103.
51. Kasahara, A., 1978: Further studies on a spectral model of the global barotropic primitive equations with Hough harmonic expansions. *J. Atmos. Sci.*, **35**, 2043-2051.
52. Kasahara, A., 1979: Toward achieving the goal of atmospheric scientists-understanding our atmosphere. *Atmospheric Technology*, National Center for Atmospheric Research, **11**, 4-10.
53. Kasahara, A., 1980a: Effect of zonal flow on the free oscillations of a barotropic atmosphere. *J. Atmos. Sci.*, **37**, 917-929.
54. Kasahara, A., 1980b: Influence of orography on the atmospheric general circulation. Chapter 1 of "Orographic Effects in Planetary Flow." GARP Publication Series No. 23, WMO-ICSU, Geneva, Switzerland, 1-49.

55. Browning, G., A. Kasahara, and H.-O. Kreiss, 1980: Initialization of the primitive equations by the bounded derivative method. *J. Atmos. Sci.*, **37**, 1424-1436.
56. Lordi, N. J., A. Kasahara, and S.-K. Kao, 1980: Numerical simulation of stratospheric sudden warmings with a primitive equation spectral model. *J. Atmos. Sci.*, **37**, 2746-2767. ~
57. Kasahara, A., and K. Puri, 1981: Spectral representation of three-dimensional global data by expansion in normal mode functions. *Mon. Wea. Rev.*, **109**, 37-51.
58. Kasahara, A., 1982a: Nonlinear normal mode initialization and the bounded derivative method. *Rev. Geophys. Space Phys.*, **20**, 385-397.
59. Kasahara, A., 1982b: Significance of non-elliptic regions in balanced flows of the tropical atmosphere. *Mon. Wea. Rev.*, **110**, 1956-1967.
60. Kasahara, A., 1983: Book review of *Intense atmospheric vortices* (L. Bengtsson and J. Lighthill, Eds.), WMO Bulletin, **32**, p. 355.
61. Kasahara, A., and Y. Shigehisa, 1983: Orthogonal vertical normal modes of a vertically staggered discretized atmospheric model. *Mon. Wea. Rev.*, **111**, 1724-1735.
62. Koerner, J. P., A. Kasahara, and S.-K. Kao, 1983: Numerical studies of major and minor stratospheric warmings caused by orographic forcing. *J. Atmos. Sci.*, **40**, 1552-1570.
63. Kasahara, A., 1984a: Recent mathematical and computational developments in numerical weather prediction. *Large Scale Scientific Computation* (S. Parter, Ed.), Academic Press, 85-125.
64. Kasahara, A., 1984b: The linear response of a stratified global atmosphere to tropical thermal forcing. *J. Atmos. Sci.*, **41**, 2217-2237.
65. Swarztrauber, P. N., and A. Kasahara, 1985: The vector harmonic analysis of the Laplace tidal equations. *SIAM J. Sci. Statist. Comp.*, **6**, 464-491.
66. Kasahara, A., and P. L. Silva Dias, 1986: Response of planetary waves to stationary tropical heating in a global atmosphere with meridional and vertical shear. *J. Atmos. Sci.*, **43**, 1893-1911.
67. Mohanty, U. C., A. Kasahara, and R. Errico, 1986: The impact of diabatic heating on the initialization of divergent circulations in a global forecast model. *J. Meteor. Soc. Japan*, **64**, 805-817.
68. Kasahara, A., 1987: Weather prediction, numerical. In the *Encyclopedia of Physical Science and Technology*, Academic Press, Vol. 14, 621-640. (Revision for the second edition is published in 1992, **17**, 657-676.
69. Kasahara, A., A. P. Mizzi, and U. C. Mohanty, 1987: Comparison of global diabatic heating rates from FGGE Level IIIb analyses with satellite radiation imagery data. *Mon. Wea. Rev.*, **115**, 2904-2935.
70. Kasahara, A., R. C. Balgovind, and B. B. Katz, 1988: Use of satellite radiometric imagery data for improvement in the analysis of divergent wind in the tropics. *Mon. Wea. Rev.*, **116**, 866-883.
71. Kasahara, A., and H. L. Tanaka, 1989: Application of vertical normal mode expansion to problems of baroclinic instability. *J. Atmos. Sci.* **46**, 489-510.
72. Mizzi, A. P., and A. Kasahara, 1989: Intercomparison of daily variations of atmospheric variables, including diabatic heating rates, from the ECMWF, GFDL and GLA FGGE Level IIIb analyses. *J. Geophys. Res.*, **94**, 14,717-14,748.

73. Xue, Y., K. -N. Liou, and A. Kasahara, 1990: Investigation of the biogeophysical feedback on the African climate using a two-dimensional model. *J. Climate*, **3**, 337-352.
74. Kasahara, A., 1991: Transient response of planetary waves to tropical heating: Role of baroclinic instability. *J. Meteor. Soc. Japan*, **69**, 293-309.
75. Kasahara, A., and A. P. Mizzi, 1992: Estimates of tropical analysis differences in daily values produced by two operational centers. *Mon. Wea. Rev.*, **120**, 279-302.
76. Tanaka, H. L., and A. Kasahara, 1992: On the normal modes of Laplace's tidal equations for zonal wavenumber zero. *Tellus*, **44A**, 18-32.
77. Kasahara, A., A. P. Mizzi, and L. J. Donner, 1992: Impact of cumulus initialization upon the spin-up of precipitation forecasts in the tropics. *Mon. Wea. Rev.*, **120**, 1360-1380.
78. Kasahara, A., A. P. Mizzi, and L. J. Donner, 1994: Diabatic initialization for improvement in the tropical analysis of divergence and moisture using satellite radiometric imagery data. *Tellus*, **46A**, 242-264.
79. Kasahara, A., 1996: Primitive equations. *Encyclopedia of Climate and Weather*. Oxford University Press, Vol.2, 612-616.
80. Kasahara, A., and A.P. Mizzi, 1996: Use of precipitation data for diabatic initialization to improve the tropical analysis of divergence and moisture. *Meteorology and Atmospheric Physics*, **60**, 143-156.
81. Tsutsui, J. and A. Kasahara, 1996: Simulated tropical cyclones using the National Center for Atmospheric Research Community Climate Model (CCM2). *J. Geophys. Res. Atmospheres*, 101 (D10), 15,013-15,032.
82. Kasahara, A., J. Tsutsui and H. Hidakuchi, 1996: Inversion methods of three cumulus parameterizations for diabatic initialization of a tropical cyclone model. *Mon. Wea. Rev.*, **124**, 2304-2321.
83. Tsutsui, J., A. Kasahara, and H. Hidakuchi, 1998: Impacts of diabatic initialization on numerical typhoon prediction. *J. Meteor. Soc. Japan*, **76**, 889-907.
84. Kasahara, A., 2000: On the origin of cumulus parameterization for numerical prediction models. In *General Circulation Model Development: Past, Present, and Future, Proc. of a Symp. In Honor of Prof. Akio Arakawa*, D. A. Randall, Ed., Academic Press, 199-224.
85. Kasahara, A., and J.-H. Qian, 2000: Normal modes of a global nonhydrostatic atmospheric model. *Mon. Wea. Rev.*, **128**, 3357-3375.
86. Kasahara, A., M. Kanamitsu, 2001: Weather Prediction, Numerical. *Encyclopedia of Physical Science and Technology*, 3rd ed., Academic Press, 17, 805-836.
87. Kasahara, A., 2003: The role of the horizontal component of Earth's angular velocity in nonhydrostatic linear models. *J. Atmos. Sci.*, **60**, 1085-1095.
88. Qian, J.-H., A. Kasahara, 2003: Nonhydrostatic atmospheric normal modes on beta-planes. *Pure Appl. Geophys.*, **160**, 1315-1358.
89. Kasahara, A., 2003: On the nonhydrostatic atmospheric models with inclusion of the horizontal component of the Earth's angular velocity. *J. Meteor. Soc. Japan*, **81**, 935-950.
90. Kasahara, A., 2004: Reply to Comments on: The roles of the horizontal components of the Earth's angular velocity in nonhydrostatic linear models. *J. Atmos. Sci.*, **61**, 1987-1991.

91. Kasahara, A., 2004: Free oscillations of deep nonhydrostatic global atmospheres: Theory and test of numerical schemes. *NCAR Technical Note, NCAR/TN-457+STR*, 69 pp.
92. Kasahara, A., J. M. Gary, 2006: Normal modes of an incompressible and stratified fluid model including the vertical and horizontal components of coriolis force. *Tellus*, **58**, 368-384, doi: 10.1111/j.1600-0870.2006.00182.x.
93. Kasahara, A., 2007: Initial-value approach to study the inertio-gravity waves without the 'traditional approximation'. *J. Comput. Phys.*, **225**, 2175-2197, doi:10.1016/j.jcp.2007.03.006.
94. Kasahara, A., 2008: A mechanism of deep-ocean mixing due to the near-inertial waves generated by the flow over bottom topography. Submitted to *Dyn. Ocean and Atmos.*

In addition, there are more than 50 technical and scientific reports.