

References and Bibliography

A

- Arakawa, A., 1966: Computational design for long-term numerical integration of the equations of fluid motion. Two-dimensional incompressible flow. Part I. *J. Comp. Phys.*, **1**, 119-143
- Arakawa, A., 1968: Numerical simulation of large-scale atmospheric motions. *Proceedings of a Symposium in Applied Mathematics*, Durham, N.C., 1968. 24-40.
- Arakawa, A., 1988: Finite-difference methods in climate modeling. *Physically-Based Modelling and Simulation of Climate and Climatic Change - Part I*, M. E. Schlesinger (ed.), Kluwer Academic Press, 79-168.
- Arakawa, A. and Y.-J. Hsu, 1990: Energy conserving and potential-entropy dissipating schemes for the shallow water equations. *Mon. Wea. Rev.*, **118**, 1960-1969.
- Arakawa A., and S. Moorthi, 1988: Baroclinic instability in vertically discrete systems. *J. Atmos. Sci.*, **45**, 1688-1707.
- Arakawa, A., 1966: Computational design for long-term numerical integration of the equations of fluid motion. Two-dimensional incompressible flow. Part I. *J. Comp. Phys.*, **1**, 119-143.
- Arakawa, A., and V. R. Lamb, 1977: Computational design of the basic dynamical processes of the UCLA general circulation model. *Methods in Computational Physics*, **17**, Academic Press, New York, pp. 173-265.
- Arakawa, A., and V. R. Lamb, 1981: A potential entropy and energy conserving scheme for the shallow water equations. *Mon. Wea. Rev.*, **109**, 18-36.
- Arfken, G., 1985: *Mathematical methods for physicists*. Academic Press, San Diego, 985 pp.
- Arpé, K., and E. Klinker, 1986: Systematic errors of the ECMWF operational forecasting model in mid-latitudes. *Quart. J. Roy. Meteor. Soc.*, **112**, 181-202.
- Asselin, R., 1972: Frequency filter for time integrations. *Mon. Wea. Rev.*, **100**, 487-490.

B

- Baer, F., and T. J. Simons, 1970: Computational stability and time truncation of coupled nonlinear equations with exact solutions. *Mon. Wea. Rev.*, **98**, 665-679. (This paper first appeared as: Baer, F. and T. J. Simons, 1968: Computational stability and time truncation of coupled nonlinear equations with exact solutions. *Colorado State University, Atmospheric Science Paper No. 131*.)

- Baer, F., 1972: An alternate scale representation of atmospheric energy spectra. *J. Atmos. Sci.*, **29**, 649-664.
- Bates, J. R., S. Moorthi, and R. W. Higgins, 1993: A global multilevel atmospheric model using a vector semi-Lagrangian finite-difference scheme. Part I: Adiabatic formulation. *Mon. Wea. Rev.*, **121**, 244-263.
- Bleck, R., 1973: Numerical forecasting experiments based on the conservations of potential vorticity on isentropic surfaces. *J. Appl. Meteor.*, **12**, 737-752.
- Bleck, R., and D. B. Boudra, 1981: Initial testing of a numerical ocean circulation model using a hybrid (quasi-isopycnic) vertical coordinate. *J. Phys. Oceanogr.*, **11**, 755-770.
- Bleck, R., 1984: Vertical coordinate transformation of vertically discretized atmospheric fields. *Mon. Wea. Rev.*, **112**, 2535-2539.
- Bleck, R., H. P. Hanson, D. Hu, and E. B. Kraus, 1989: Mixed layer-thermocline interaction in a three-dimensional isopycnic coordinate model. *J. Phys. Oceanogr.*, **19**, 1417-1439.
- Bleck, R., and S. G. Benjamin, 1993: Regional weather prediction with a model combining terrain-following and isentropic coordinates. Part I: Model description. *Mon. Wea. Rev.*, **121**, 1770-1785.
- Boris, J. P., and D. L. Book, 1973: Flux-corrected transport I: SHASTA -- a fluid transport algorithm that works. *J. Comp. Phys.*, **11**, 38-69.

C-D

- Durran, D. R., 1991: The third-order Adams-Bashforth method: An attractive alternative to leapfrog time differencing. *Mon. Wea. Rev.*, **119**, 702-720.

E

- Eliassen, A., B. Machenhauer, and E. Rasmussen, 1970: On a numerical method for integration of the hydrodynamical equations with a spectral representation of the horizontal fields. *Rept. No. 2, Institute for Theoretical Meteorology*, Copenhagen University, Copenhagen, 35 pp.
- Eliassen, A., and E. Raustein, 1968: A numerical integration experiment with a model atmosphere based on isentropic coordinates. *Meteorologiske Annaler*, **5**, 45-63.
- Eliassen, A., and E. Raustein, 1970: A numerical integration experiment with a six-level atmospheric model with isentropic information surface. *Meteorologiske Annaler*,

5, 429-449.

F

Fulton, S. R., P. E. Ciesielski, and W. H. Schubert, 1986: Multigrid methods for elliptic problems: A review. *Mon. Wea. Rev.*, **114**, 943-959.

G

Gerald, C. F., 1970: *Applied Numerical Analysis*, Addison-Wesley, 340 pp.

Green, J. S. A., 1970: Transfer properties of the large-scale eddies and the general circulation of the atmosphere. *Quart. J. Roy. Meteor. Soc.*, **96**, 157-185.

H

Haertel, P. T., and D. A. Randall, 2001: Could a pile of slippery sacks behave like an ocean? Undergoing revisions for *Mon. Wea. Rev.*

Haltiner, G. J., Williams, R. T., 1984: *Numerical Prediction and Dynamic Meteorology*. Wiley.

Hansen, J., G. Russell, D. Rind, P. Stone, A. Lacis, S. Lebedeff, R. Ruedy, and L. Travis, 1983: Efficient three-dimensional global models for climate studies: Models I and II. *Mon. Wea. Rev.*, **111**, 609-662.

Heckley, W. A., 1985: Systematic errors of the ECMWF operational forecasting model in tropical regions. *Quart. J. Roy. Meteor. Soc.*, **111**, 709-738.

Heikes, R. P., and D. A. Randall, 1995: Numerical integration of the shallow water equations on a twisted icosahedral grid. Part I: Basic design and results of tests. *Mon. Wea. Rev.*, **123**, 1862-1880.

Heikes, R. P., and D. A. Randall, 1995: Numerical integration of the shallow water equations on a twisted icosahedral grid. Part II: Grid refinement, accuracy and computational performance. *Mon. Wea. Rev.*, **123**, 1881-1887.

Holzer, M., 1996: Optimal spectral topography and its effect on model climate. *J. Climate*, **9**, 2443-2463.

Hoskins, B. J., M. E. McIntyre, and A. W. Robertson, 1985: On the use and significance of isentropic potential vorticity maps. *Quart. J. Roy. Meteor. Soc.*, **111**, 877-946.

Hsu, Y.-J., and A. Arakawa, 1990: Numerical modeling of the atmosphere with an isentropic vertical coordinate. *Mon. Wea. Rev.*, **118**, 1933-1959.

J

- Janjic, Z. I., and F. Mesinger, 1989: Response to small-scale forcing on two staggered grids used in finite-difference models of the atmosphere. *Q. J. Roy. Meteor. Soc.*, **115**, 1167-1176.
- Janjic, Z. I., 1990: The step-mountain coordinate: Physical package. *Mon. Wea. Rev.*, **118**, 1429-1443.
- Jarraud, M., and A. J. Simmons, 1983: The spectral technique. *Seminar on Numerical Methods for Weather Prediction*, European Centre for Medium Range Weather Prediction, Reading, England, 99. 1-59.
- Johnson, D. R., and L. W. Uccellini, 1983: A comparison of methods for computing the sigma-coordinate pressure gradient force for flow over sloped terrain in a hybrid theta-sigma model. *Mon. Wea. Rev.*, **111**, 870-886.

K

- Kalnay-Rivas, E., A. Bayliss, and J. Storch, 1977: The 4th order GISS model of the global atmosphere. *Contrib. Atmos. Phys.*, **50**, 306-311.
- Kalnay, E. and M. Kanamitsu, 1988: Time schemes for strongly nonlinear damping equations. *Mon. Wea. Rev.*, **116**, 1945-1958.
- Kasahara, A., 1974: Various vertical coordinate systems used for numerical weather prediction. *Mon. Wea. Rev.*, **102**, 509-522.
- Kasahara, A., and W. M. Washington, 1967: NCAR global general circulation model of the atmosphere. *Mon. Wea. Rev.*, **95**, 7, 389-402.
- Konor, C. S., and A. Arakawa, 1997: Design of an atmospheric model based on a generalized vertical coordinate. *Mon Wea. Rev.*, **125**, 1649-1673.
- Krueger, S. K., 1988: Numerical simulation of tropical cumulus clouds and their interaction with the subcloud layer. *J. Atmos. Sci.*, **45**, 2221-2250.
- Kurihara, Y., 1965: Numerical Integration of the Primitive Equations on a Spherical Grid. *Mon. Wea. Rev.*, **93**, 399-415.

L

- Laprise, R., 1992: The resolution of global spectral models. *Bull. Amer. Meteor. Soc.*, **73**, 1453-1454.
- Lax, P. D. and B. Wendroff, 1960: Systems of conservation laws. *Communications on*

pure and applied mathematics, **XIII**, pp. 217-237.

Lilly, D. K., 1965: On the computational stability of numerical solutions of time-dependent nonlinear geophysical fluid dynamics problems. *Mon. Wea. Rev.*, **93**, 11-26.

Lindberg, C., and A. Broccoli, 1996: Representation of topography in spectral climate models and its effect on simulated precipitation. *J. Climate*, **9**, 2641-2659.

Lindzen, R. S., and H.-L. Kuo, 1969: A reliable method for the numerical integration of a large class of ordinary and partial differential equations. *Mon. Wea. Rev.*, **97**, 732-734.

Lorenz, E. N., 1955: Available potential energy and the maintenance of the general circulation. *Tellus*, **7**, 157-167.

Lorenz, E. N., 1960: Energy and numerical weather prediction. *Tellus*, **12**, 364-373.

Lorenz, E. N., 1969: Three approaches to atmospheric predictability. *Bull. Amer. Meteor. Soc.*, **50**, 345-349.

Lorenz, E. N., 1982: Atmospheric predictability experiments with a large numerical model. *Tellus*, **34**, 505-513.

M

Masuda, Y., and H. Ohnishi, 1986: An Integration Scheme of the Primitive Equations Model with an Icosahedral-Hexagonal Grid System and its Application to the Shallow Water Equations. *Short- and Medium-Range Numerical Weather Prediction*. Japan Meteorological Society, Tokyo, 317-326.

Matsuno, T., 1966: Numerical integrations of the primitive equations by a simulated backward difference method. *J. Meteor. Soc. Japan*, **Ser. 2 44**, 76-84.

Matsuno, T., 1966: False reflection of waves at the boundary due to the use of finite differences. *J. Meteor. Soc. Japan*, **Ser. 2 44**, 145-157.

McKee, T. B., and S. K. Cox, 1974: Scattering of visible radiation by finite clouds. *J. Atmos. Sci.*, **31**, 1885-1892.

McGregor, J. L., 1996: Semi-Lagrangian advection on conformal-cubic grids. *Mon Wea. Rev.*, **124**, 1311-1322.

Mellor, G. L., and T. Yamada, 1974: A hierarchy of turbulence closure models for the planetary boundary layer. *J. Atmos. Sci.*, **31**, 1791-1806.

- Mesinger, F., 1971: Numerical integration of the primitive equations with a floating set of computation points: Experiments with a barotropic global model. *Mon. Wea. Rev.*, **99**, 15-29.
- Mesinger, F., and Z. I. Janjic, 1985: Problems and numerical methods of the incorporation of mountains in atmospheric models. *Large-Scale Computations in Fluid Mechanics*. Part 2. Lec. Appl. Math., **22**, Amer. Math. Soc., 81-120.
- Monaghan, J. J., 1992: Smoothed particle hydrodynamics. *Ann. Rev. Astron. Astrophys.*, **30**, 543-574.
- Moeng, C.-H., 1984: A large-eddy simulation model for the study of planetary boundary-layer turbulence. *J. Atmos. Sci.*, **41**, 2052-2062.
- Moeng, C.-H., and J. C. Wyngaard, 1986: An analysis of closures for pressure-scalar covariances in the convective boundary layer. *J. Atmos. Sci.*, **43**, 2499-2513.
- Monaghan, J. J., 1992: Smoothed particle hydrodynamics. *Ann. Rev. Astron. Astrophys.*, **30**, 543-574.
- Morse, P. M., and H. Feshbach, 1953: *Methods of theoretical physics, Part I*. McGraw-Hill, 997 pp.

N

- Nitta, T., 1964: On the reflective computational wave caused by the outflow boundary condition. *J. Met. Soc. Japan*, **42**, 274-276.
- Norris, P. M., 1996: *Radiatively-driven convection in marine stratocumulus clouds*. Ph.D. thesis, University of California, San Diego, 175 pp.
- North, G. R., 1975: Theory of energy balance climate models. *J. Atmos. Sci.*, **32**, 2033 - 2043.

O

- Orszag, S. A., 1970: Transform method for the calculation of vector-coupled sums: Application to the spectral form of the vorticity equation. *J. Atmos. Sci.*, **27**, 890-902.

P

- Phillips, N. A., 1957: A coordinate system having some special advantages for numerical forecasting. *J. Meteor.*, **14**, 184-185.

- Phillips, N. A., 1957: A map projection system suitable for large-scale numerical weather prediction. *J. Meteor. Soc. Japan.*, **75**, 262-267.
- Phillips, N. A., 1959: An example of non-linear computational instability. In *The Atmosphere and Sea in Motion*, (Bert Bolin, ed.), Rockefeller Inst. Press, New York, 501-504.
- Phillips, N. A., 1959: Numerical Integration of the Primitive Equations on the Hemisphere. *Mon. Wea. Rev.*, **87**, 333-345.
- Platzman, G. W., 1954: The computational stability of boundary conditions in numerical integration of the vorticity equation. *Arch. Meteor. Geophys. u. Bioklimatol., Ser. A7*, 29-40.
- Popper, K. R., 1959: *The logic of scientific discovery*. Hutchinson Education, 479 pp.
- Purser, R. J., and M. Rancic, 1998: Smooth quasi-homogeneous gridding of the sphere. *Quart. J. Roy. Meteor. Soc.*, **124**, 637-647.

Q - R

- Randall, D. A., 1994: Geostrophic adjustment and the finite-difference shallow-water equations. *Mon. Wea. Rev.*, **122**, 1371-1377.
- Richtmeyer, 1963: A survey of difference methods for nonsteady fluid dynamics. *NCAR Technical Note 63-2*, NCAR, Boulder, Colo.
- Ringler, T. D., R. P. Heikes, and D. A. Randall, 1999: Modeling the atmospheric general circulation using a spherical geodesic grid: A new class of dynamical cores. *Mon. Wea. Rev.* (in press).
- Robert, A., T. L. Yee, and H. Ritchee, 1985: Semi-Lagrangian and semi-implicit numerical integration scheme for multilevel atmospheric models. *Mon. Wea. Rev.*, **113**, 388-394.

S

- Sadourny, R., A. Arakawa, and Y. Mintz, 1968: Integration of the Nondivergent Barotropic Vorticity Equation with an Icosahedral-Hexagonal Grid for the Sphere. *Mon. Wea. Rev.*, **96**, 351-356.
- Sadourny, R., and P. Morel, 1969: A Finite Difference Approximation of the Primitive Equations for a Hexagonal Grid on a Plane. *Mon. Wea. Rev.*, **97**, 439-445.
- Semtner, A. J., Jr., and R. M. Chervin, 1992: Ocean general circulation from a global eddy-

resolving model. *J. Geophys. Res.*, **97C**, 5493-5551.

Shewchuk, J. R., 1994: An introduction to the conjugate gradient method without the agonizing pain. Available on the web at <http://www.cs.berkeley.edu/~jrs/>.

Silberman, I., 1954: Planetary waves in the atmosphere. *J. Meteor.*, **11**, 27-34.

Simmons, A. J., and D. M. Burridge, 1981: Energy and angular-momentum conserving vertical finite-difference scheme and hybrid vertical coordinates. *Mon. Wea. Rev.*, **109**, 758-7661.

Smagorinski, J., 1963: General circulation experiments with the primitive equations. *Mon. Wea. Rev.*, **91**, 99-164.

Smolarkiewicz, P. K., 1991: Nonoscillatory advection schemes. In *Proceedings of the Seminar on Numerical Methods in Atmospheric Models*, ECMWF, November 1991.

Staniforth, A., and J. Cote, 1991: Semi-lagrangian integration schemes for atmospheric models -- A review. *Mon. Wea. Rev.*, **119**, 2206-2223.

T

Takacs, L. L., 1985: A two-step scheme for the advection equation with minimized dissipation and dispersion errors. *Mon. Wea. Rev.*, **113**, 1050-1065.

Trease, H. E., 1988: Three-dimensional free-Lagrange hydrodynamics. *Computer Physics Communications*, **48**, 39-50.

U - V - W

Williamson, D. L., 1968: Integration of the Barotropic Vorticity Equation on a Spherical Geodesic Grid. *Tellus*, **20**, 642-653.

Williamson, D. L., 1970: Integration of the Primitive Barotropic Model over a Spherical Geodesic Grid. *Mon. Wea. Rev.*, **98**, 512-520.

Williamson, D. L., 1971: Numerical Methods Used in Atmospheric Models, GARP Pub. Ser. No. 17 (JOC, WMO, Geneva, 1979), Chap. 2, 51-120.

Williamson, D. L., and J. G. Olson, 1994: Climate simulations with a semi-Lagrangian version of the NCAR Community Climate Model. *Mon. Wea. Rev.*, **122**, 1594-1610.

Williamson, D. L., J. B. Drake, J. J. Hack, R. Jakob, and P. N. Swarztrauber, 1992: A

Standard Test Set for Numerical Approximations to the Shallow Water Equations in Spherical Geometry. *J. Comp. Phys.*, **102**, 221-224.

Williamson, D. L., and P. J. Rasch, 1994: Water vapor transport in the NCAR CCM2. *Tellus*, **46A**, 34-51.

Winninghoff, F. J., 1968: On the adjustment toward a geostrophic balance in a simple primitive equation model with application to the problems of initialization and objective analysis. Ph.D. thesis, UCLA.

Wurtele, 1961: On the problem of truncation error. *Tellus*, **13**, 379-391.

Y-Z

Zalesak, S. T., 1979: Fully multidimensional flux-corrected transport algorithms for fluids. *J. Comp. Phys.*, **31**, 335-362.

Zapotocny, T. H., D. R. Johnson, and F. M. Reames, 1994: Development and initial test of the University of Wisconsin global isentropic-sigma model. *Mon. Wea. Rev.*, **122**, 2160-2178.

Zhu, Z., J. Thuburn, B. J. Hoskins, and P. H. Haynes, 1992: A vertical finite-difference scheme based on a hybrid σ - θ - p coordinate. *Mon. Wea. Rev.*, **120**, 851-862.

