General References

D. A. Anderson, J. C. Tannehill, and R. H. Pletcher, *Computational Fluid Mechanics and Heat Transfer*, McGraw-Hill, 1984.

J. P. Boyd, *Chebyshev & Fourier Spectral Methods*, Springer-Verlag, 1989.

J. C. Butcher, *The Numerical Analysis of Ordinary Differential Equations*, Wiley, 1987.

C. Canuto, M. Y. Hussaini, A. Quarteroni, and T. A. Zang, *Spectral Methods in Fluid Dynamics*, Springer, 1987.

R. Courant and D. Hilbert, *Methods of Mathematical Physics*, v. I and II, Wiley-Interscience, 1953.

C. W. Gear, *Numerical Initial Value Problems in Ordinary Differential Equations*, Prentice-Hall, 1971.

W. Hackbusch, *Multi-grid Methods and Applications*, Springer-Verlag, 1985.

W. Hackbusch and U. Trottenberg, *Multigrid Methods*, Lect. Notes in Math., v. 960, Springer-Verlag, 1982.

G. H. Golub and C. F. Van Loan, *Matrix Computations*, Johns Hopkins Univ. Press, 1983.

E. Hairer, S. P. Nørsett, and G. Wanner, *Solving Ordinary Differential Equations I*, Springer-Verlag, 1987.

F. John, *Partial Differential Equations*, Springer-Verlag, 1978.

H. Kreiss and J. Oliger, *Methods for the Approximate Solution of Time Dependent Problems*, Global Atm. Res. Prog. Publ. 10, GARP, 1973.

J. D. Lambert, *Computational Methods in Ordinary Differential Equations*, Wiley, 1973.

R. J. LeVeque, *Numerical Methods for Conservation Laws*, Birkhäuser-Verlag, to appear.

A. R. Mitchell and D. F. Griffiths, *Computational Methods in Partial Differential Equations*, Wiley, 1980.

P. M. Morse and H. Feshbach, *Methods of Mathematical Physics*, v. I and II, McGraw-Hill, 1953.

R. Peyret and T. D. Taylor, *Computational Methods for Fluid Flow*, Springer-Verlag, 1983.

R. D. Richtmyer and K. W. Morton, *Difference Methods for Initial-Value Problems*, 2nd ed., Wiley-Interscience, 1967.

G. A. Sod, *Numerical Methods in Fluid Dynamics*, Cambridge Univ. Press, 1985.

Journals

ACM Transactions on Mathematical Software

AIAA Journal

BIT

Communications on Pure and Applied Mathematics

IMA Journal of Numerical Analysis

Journal of Computational Physics

Journal of Computational and Applied Mathematics

Journal of Scientific Computing

Mathematics of Computation

Numerische Mathematik

SIAM Journal on Numerical Analysis

SIAM Journal on Scientific and Statistical Computing

SIAM Review

References for Chapter 1

The following list comprises most of the the standard books on the numerical solution of ordinary differential equations. Henrici, Stetter, and Dekker & Verwer represent the theoretical end of the spectrum, Shampine & Gordon the practical. The pamphlet by Sand and Østerby is a delightful compendium of plots of stability regions. Coddington & Levinson and Bender & Orszag present the mathematical theory of ordinary differential equations from the pure and applied points of view, respectively. Lambert and Gear are perhaps the best general introductions to numerical methods for o.d.e.'s, while Butcher's book is a more detailed treatise containing 100 pages of references up to 1982. The books by Keller and by Ascher, Mattheij & Russell treat boundary-value o.d.e. problems (not covered in this book). For perspective, historical notes, and sense of humor one cannot do better than Hairer, Nørsett and Wanner.

U. M. Ascher, R. M. M. Mattheij, R. D. Russell, *Numerical Solution of Boundary Value Problems for Ordinary Differential Equations*, Prentice-Hall, 1988.

C. M. Bender and S. A. Orszag, *Advanced Mathematical Methods for Scientists and Engineers*, McGraw-Hill, 1978.

J. C. Butcher, *The Numerical Analysis of Ordinary Differential Equations*, Wiley, 1987.

G. D. Byrne and A. C. Hindmarsh, "Stiff ODE solvers: A review of current and coming attractions," *J. Comp. Phys. 70* (1987), 1–62.

E. A. Coddington and N. Levinson, *Theory of Ordinary Differential Equations*, McGraw-Hill, 1955.

K. Dekker and J. G. Verwer, *Stability of Runge-Kutta Methods for Stiff Nonlinear Differential Equations*, North-Holland, 1984.

C. W. Gear, *Numerical Initial Value Problems in Ordinary Differential Equations*, Prentice-Hall, 1971.

E. Hairer, S. P. Nørsett, and G. Wanner, *Solving Ordinary Differential Equations I*, Springer, 1987.

P. Henrici, *Discrete Variable Methods in Ordinary Differential Equations*, Wiley, 1962.

H. B. Keller, *Numerical Solution of Two Point Boundary Value Problems*, SIAM, 1976.

J. D. Lambert, *Computational Methods in Ordinary Differential Equations*, Wiley, 1973.

L. Lapidus and J. H. Seinfeld, *Numerical Solution of Ordinary Differential Equations*, Academic Press, 1971.

J. Sand and O. Østerby, *Regions of Absolute Stability*, Rep. PB-102, Comp. Sci. Dept., Aarhus Univ., Denmark, 1979.

L. F. Shampine and C. W. Gear, "A user's view of solving stiff ordinary differential equations," *SIAM Review 21* (1979), 1–17.

L. F. Shampine and M. K. Gordon, *Computer Solution of Ordinary Differential Equations*, W. H. Freeman, 1975.

H. J. Stetter, *Analysis of Discretization Methods for Ordinary Differential Equations*, Springer-Verlag, 1973.

References for Chapter 2

Mathematical treatments of Fourier analysis appear in many books of analysis, partial differential equations, and applications, as well as in books devoted to Fourier analysis itself. Fourier analysis is also discussed in books in many other fields, especially digital signal processing. The following references include a sampling of various kinds. For rigorous theory, the books by Katznelson and by Stein and Weiss are both excellent and readable; the classic is by Zygmund. For discrete FFT's as they appear in complex analysis, the best source is Henrici.

Bracewell

Brigham

P. L. Butzer and R. J. Nessel, *Fourier Analysis and Approximation*, 1976.

Churchill

H. Dym and H. P McKean, *Fourier Series and Integrals*, Academic Press, 1972.

G. Edwards, *Fourier Series*, 1979.

P. Henrici, *Applied and Computational Complex Analysis, III*, Wiley, 1986 (chap. 13).█

Y. Katznelson, *An Introduction to Harmonic Analysis*, Dover, 1976.

A. V. Oppenheim and R. W. Schafer, *Digital Signal Processing*, Prentice-Hall, 1975.

W. H. Press, et al., *Numerical Recipes*, Cambridge Univ. Press, 1986.

W. Rudin, *Real and Complex Analysis*, McGraw-Hill, 1974.

E. M. Stein and G. Weiss, *Introuction to Fourier Analysis on Euclidean Spaces*, Princeton Univ. Press, 1971.

I. N. Sneddon, *Fourier Transforms*, McGraw-Hill, 1951.

P. N. Swarztrauber, "Symmetric FFT's," *Math. Comput. 47*, 323–346.

A. Zygmund, *Trigonometric Series*, Cambridge University Press, 1959.

References for Chapter 5

P. Brenner, V. Thomée, and L. Wahlbin, *Besov Spaces and Applications to Difference Methods for Initial Value Problems*, Springer Lect. Notes in Math. v. 434, 1975.

R. C. Y. Chin and G. W. Hedstrom, "A dispersion analysis for difference schemes: tables of generalized Airy functions," *Math. Comp. 32* (1978), 1163–1170.

M. B. Giles and W. T. Thompkins, Jr., "Propagation and stability of wavelike solutions of finite difference equations with variable coefficients," *J. Comp. Phys. 58* (1985), 349–360.

J. Lighthill, *Waves in Fluids*, Cambridge University Press, 1978.

Shokin, book on modified equations, etc.

L. N. Trefethen, "Group velocity in finite difference schemes," *SIAM Review 24* (1982), 113–136.

L. N. Trefethen, "Dispersion, dissipation, and stability," in D. F. Griffiths and G. A. Watson, eds., *Numerical Analysis*, Longman, 1986.

R. Vichnevetsky and J. B. Bowles, *Fourier Analysis of Numerical Approximations of Hyperbolic Equations*, SIAM, 1982.

R. F. Warming and B. J. Hyett, "The modified equation approach to the stability and accuracy analysis of finite-difference methods," *J. Comp. Phys. 14* (1974), 159–179.

G. B. Whitham, *Linear and Nonlinear Waves*, Wiley-Interscience, 1974.

References for Chapter 6

Four basic papers on well-posedness and stability for hyperbolic IBVP's:

H.-O. Kreiss, "Initial boundary value problems for hyperbolic systems," *Comm. Pure and Appl. Math. 23* (1970), 277–298. *[Well-posedness for hyperbolic IBVP's.]*

R. L. Higdon, "Initial-boundary value problems for linear hyperbolic systems," *SIAM Review 28* (1986), 177–217. *[Wave propagation interpretation of above.]*

B. Gustafsson, H.-O. Kreiss, and A. Sundström, "Stability theory of difference approximations for initial boundary value problems. II", *Math. Comput. 26* (1972), 649–686. *[Stability for hyperbolic finite difference models.]*

L. N. Trefethen, "Instability of difference models for hyperbolic initial boundary value problems," *Commun. Pure and Appl. Math. 37* (1984), 329–367. *[Wave propagation interpretation of above.]*

Additional references:

B. Engquist and A. Majda, "Absorbing boundary conditions for the numerical simulation of waves," *Math. Comp. 31* (1977), 629–651.

M. Golberg and E. Tadmor, "Convenient stability criteria for difference approximations of hyperbolic initial-boundary value problems. II," *Math. Comp. 48* (1987), 503–520.

G. A. Sod, *Numerical Methods in Fluid Dynamics,* Cambridge University Press, 1985.

References for Chapter 8

C. Canuto, M. Y. Hussaini, A. Quarteroni, and T. A. Zang, *Spectral Methods in Fluid Dynamics*, Springer-Verlag, 1988.

B. Fornberg, "On a Fourier method for the integration of hyperbolic equations," *SIAM J. Numer. Anal. 12* (1977), 509–528.

D. Gottlieb and S. A. Orszag, *Numerical Analysis of Spectral Methods: Theory and Applications*, SIAM, Philadelphia, 1977.

R. G. Voigt, D. Gottlieb, and M. Y. Hussaini, *Spectral Methods for Partial Differential Equations*, SIAM, Philadelphia, 1984.

References for Chapter 9

C. Canuto, M. Y. Hussaini, A. Quarteroni, and T. A. Zang, *Spectral Methods in Fluid Dynamics*, Springer-Verlag, 1988.

D. Gottlieb and S. A. Orszag, *Numerical Analysis of Spectral Methods: Theory and Applications*, SIAM, Philadelphia, 1977.

T. J. Rivlin, *The Chebyshev Polynomials*, Wiley, 1974.

R. G. Voigt, D. Gottlieb, and M. Y. Hussaini, *Spectral Methods for Partial Differential Equations*, SIAM, Philadelphia, 1984.

References for Chapter 8

C. Canuto, M. Y. Hussaini, A. Quarteroni, and T. A. Zang, *Spectral Methods in Fluid Dynamics*, Springer-Verlag, 1988.

B. Fornberg, "On a Fourier method for the integration of hyperbolic equations," *SIAM J. Numer. Anal. 12* (1977), 509–528.

D. Gottlieb and S. A. Orszag, *Numerical Analysis of Spectral Methods: Theory and Applications*, SIAM, Philadelphia, 1977.

R. G. Voigt, D. Gottlieb, and M. Y. Hussaini, *Spectral Methods for Partial Differential Equations*, SIAM, Philadelphia, 1984.