

NUMERICAL CODES

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Codes and Papers related to Numerical Codes

I. ORBIT

The guiding center code orbit, for the analysis of guiding center motion in tokamaks, is available at `/u/ftp/pub/white/Orbit`. Some of the papers related to it are:

GENERAL

- 1 Hamiltonian Guiding Center Drift Orbit Calculation for Toroidal Plasmas of Arbitrary Cross Section
R. B. White and M. S. Chance
Phys. Fluids [27], 2455-2467 (October 1984)
- 2 Canonical Magnetic and Particle Drift Hamiltonians
A. H. Boozer, G. Kuo-Petravic, H. E. Mynick, R. B. White, and M. S. Chance
Proceedings 1984 IAEA Meeting, London, UK, (September 1984) (International Atomic Energy Agency, Vienna, Austria, 1985) Vol. [I], xx (1985)
- 3 Canonical Hamiltonian Guiding Center Variables
R. B. White
Phys. Fluids B[2], (4), 845-847 (1990)

PLT

- 4 Theory of Mode-Induced Beam Particle Loss in Tokamaks
R. B. White, R. J. Goldston, K. McGuire, A. H. Boozer,
D. A. Monticello, and W. Park
Phys. Fluids [26], 2958-2965 (October 1983)

TFTR

- 5 Measurements of DT Alpha Particle Loss Near the Outer Midplane of TFTR
S. J. Zweben, D. S. Darrow, H. W. Herrmann, M. H. Redi, J. Schivell, and R. B. White
Nucl. Fusion 35, 1445 (1995)
- 6 Collisional Stochastic Ripple Diffusion of Alpha Particles and Beam Ions on TFTR
M. H. Redi, M. C. Zarnstorff, R. B. White, R. V. Budny, J. F. Schivell, S. D. Scott, A. Janos, and J. Zweben
Nucl. Fusion [35], 1191-1211 (1995)
- 7 Modelling TF ripple loss of alpha particles in TFTR DT experiments
M. H. Redi et. al. Nuclear Fusion 35, 1509-1516 (1995)
- 8 Simulations of alpha particle ripple loss from the International Thermonuclear Experimental Reactor
M. H. Redi, R. V. Budny, D. C. McCune, C. O. Miller, and R. B. White
Phys. Plasmas [3] 3037-3042 (1996)

- 9 Calculations of alpha particle loss for reversed magnetic shear in the Tokamak Fusion Test Reactor
M. H. Redi, R. B. White, S. H. Batha, F. M. Levinton, and D. C. McCune
Phys. Plasmas [4] 4001-4008 (November, 1997)
- 10 E. Ruskov, M. Bell, R. V. Budny, D. C. McCune, S. S. Medley, M. H. Redi, S. Scott, E. J Synakowski,
S. von Goeler, R. B. White, and S. J. Zweben
Phys. Rev Lett 82, 924 (1999)
- 11 Numerical Study of the nonlinear evolution of Toroidicity-induced Alfven Eigenmodes
Yang Chen, R. B. White, Guo-yong Fu, Raffi Nazikian
Phys. Plasmas [6] 226-237 (1999)

ITER

- 12 TF Ripple Loss of Alpha Particles from the ITER Interim Design: Simulation and Theory
M. H. Redi, R. J. Goldston, R. B. White, R. V. Budny, D. C. McCune, C. O. Miller, and S. J. Zweben
Proceedings of the Twenty third European Physical Society Conference on Controlled Fusion and Plasma Physics (Kiev, Ukraine, 1996) Vol. I, pp55-58
- 13 Alpha-Particle Physics for ITER
S. Putvinski et. al.
Fourteenth International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Wurzburg, Germany, September 1992 in [Proceedings of the Fourteenth International Conference on Plasma Physics and Controlled Nuclear Fusion Research], (Wurzburg, Germany, September 1992) (International Atomic Energy Agency, Vienna, Austria) Paper IAEA-F1-CN-60
- 14 Alpha Particle Physics for ITER
S. Putvinski et. al. 15th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Sevilla, 1994 (IAEA editor Vienna, 1995), p535-541,IAEA-CN-60/D-III-4

D-III-D

- 15 The toroidicity induced Alfven eigenmode structure in DIII-D: implications of soft x-ray and beam-ion loss data,
E. M. Carolipio, W. W. Heidbrink, C. Z. Cheng, G. Y. Fu, D. A. Spong, A. D. Turnbull, and R. B. White,
Physics of Plasmas 8, 3391 July (2001)

TORE-SUPRA

- 16 Rotation and Particle Loss in Tore Supra
R. B. White, F. W. Perkins, X. Garbet, C. Bourdelle, V. Basiuk, L. G. Eriksson
Proceedings of European Physical Society Meeting, Budapest June (2000)

ALCATOR

- 17 Generation of plasma rotation in a tokamak by ion cyclotron absorption of fast Alfven Waves.
F. W. Perkins, R. B. White, P. T. Bonoli and V. S. Chan,
Physics of Plasmas 8, 2181 May (2001)

NSTX

- 18 Energetic particle orbits in the National Spherical Tokamak Experiment
D. R. Mikkelsen, R. B. White, R. J. Akers, S. M. Kaye, D. C. McCune, and J. E. Menard
Phys. Plasmas [4] 3667-3675 (October, 1997)

JET

- 19 Comparison of Theory with Rotation Measurements in JET ICRH Plasmas
R. V. Budny, C. S. Chang, C. Giroud, R. J. Goldston, D. McCune, J. Ongena, F. W. Perkins, R. B. White, K. D. Zastrow
EPS Conference Madiera Portugal (2001)

II. ORBIT3d

The guiding center code orbit3d, for the analysis of guiding center motion in stellarators, is available at [/u/ftp/pub/white/Orbit3d](#). Some papers related to it are:

- 1 Energetic particle transport in compact quasi-axisymmetric stellarators
M. H. Redi, H. E. Mynick, M. Suewattana, R. B. White, and M. C. Zarnstorff
Phys. Plas. [6], 3509-3520 (September 1999)
- 2 Recent advances in the design of quasiaxisymmetric stellarator plasma configurations,
A. Reiman et al.,
Physics of Plasmas 8, 2083 May (2001)

III. WKB

The code wkb, for the analysis of differential equations using phase integral methods, is available at [/u/ftp/pub/white/Wkb](#). Some papers related to it are:

- 1 An Interactive Code for Solving Differential Equations Using Phase Integral Methods
R. B. White
J. Comput. Phys. [31], 409-424 (June 1979)
- 2 Theory of Universal Eigenmodes in a Sheared Magnetic Field
L. Chen, P. N. Guzdar, R. B. White, P. K. Kaw, and C. R. Oberman
Princeton University, Plasma Physics Laboratory Report PPPL-1446 (May 1978) 15 pp.
Phys. Rev. Lett. [41], 649-653 (August 1978)