## **NAG Library Chapter Contents**

## **F04** – Simultaneous Linear Equations

F04 Chapter Introduction – a description of the Chapter and an overview of the algorithms available

Routine Name	Mark of Introduction	Purpose
F04ABF	2	nagf_linsys_withdraw_real_posdef_solve_ref Solution of real symmetric positive definite simultaneous linear equations with multiple right-hand sides using iterative refinement (Black Box) Note: this routine is scheduled for withdrawal at Mark 28, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
F04AEF	2	nagf_linsys_withdraw_real_square_solve_ref Solution of real simultaneous linear equations with multiple right-hand sides using iterative refinement (Black Box) Note: this routine is scheduled for withdrawal at Mark 28, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
F04AMF	2	nagf_linsys_real_gen_lsqsol Least squares solution of $m$ real equations in $n$ unknowns, rank $= n$ , $m \ge n$ using iterative refinement (Black Box)
F04ASF	4	nagf_linsys_withdraw_real_posdef_solve_1rhs Solution of real symmetric positive definite simultaneous linear equations, one right-hand side using iterative refinement (Black Box) Note: this routine is scheduled for withdrawal at Mark 28, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
F04ATF	4	nagf_linsys_withdraw_real_square_solve_1rhs Solution of real simultaneous linear equations, one right-hand side using iterative refinement (Black Box) Note: this routine is scheduled for withdrawal at Mark 28, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
F04AXF	7	nagf_linsys_real_sparse_fac_solve Solution of real sparse simultaneous linear equations (coefficient matrix already factorized)
F04BAF	21	nagf_linsys_real_square_solve Computes the solution, estimated condition number and error-bound to a real system of linear equations
F04BBF	21	nagf_linsys_real_band_solve Computes the solution, estimated condition number and error-bound to a real banded system of linear equations
F04BCF	21	nagf_linsys_real_tridiag_solve Computes the solution, estimated condition number and error-bound to a real tridiagonal system of linear equations
F04BDF	21	nagf_linsys_real_posdef_solve Computes the solution, estimated condition number and error-bound to a real symmetric positive definite system of linear equations
F04BEF	21	nagf_linsys_real_posdef_packed_solve Computes the solution, estimated condition number and error-bound to a real symmetric positive definite system of linear equations, packed storage
F04BFF	21	nagf_linsys_real_posdef_band_solve Computes the solution, estimated condition number and error-bound to a real symmetric positive definite banded system of linear equations

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F04BGF	21	nagf_linsys_real_posdef_tridiag_solve Computes the solution, estimated condition number and error-bound to a
F04BHF	21	real symmetric positive definite tridiagonal system of linear equations nagf_linsys_real_symm_solve
F04BJF	21	Computes the solution, estimated condition number and error-bound to a real symmetric system of linear equations nagf linsys real symm packed solve
		Computes the solution, estimated condition number and error-bound to a real symmetric system of linear equations, packed storage
F04CAF	21	nagf_linsys_complex_square_solve Computes the solution, estimated condition number and error-bound to a complex system of linear equations
F04CBF	21	nagf_linsys_complex_band_solve Computes the solution, estimated condition number and error-bound to a
F04CCF	21	complex banded system of linear equations nagf_linsys_complex_tridiag_solve Computes the solution, estimated condition number and error-bound to a
F04CDF	21	complex tridiagonal system of linear equations nagf_linsys_complex_posdef_solve Computes the solution, estimated condition number and error-bound to a
F04CEF	21	complex Hermitian positive definite system of linear equations nagf_linsys_complex_posdef_packed_solve
		Computes the solution, estimated condition number and error-bound to a complex Hermitian positive definite system of linear equations, packed storage
F04CFF	21	nagf_linsys_complex_posdef_band_solve Computes the solution, estimated condition number and error-bound to a complex Hermitian positive definite banded system of linear equations
F04CGF	21	nagf_linsys_complex_posdef_tridiag_solve Computes the solution, estimated condition number and error-bound to a
F04CHF	21	complex Hermitian positive definite tridiagonal system of linear equations nagf_linsys_complex_herm_solve Computes the solution and error-bound to a complex Hermitian system of
F04CJF	21	linear equations nagf_linsys_complex_herm_packed_solve
F04DHF	21	Computes the solution, estimated condition number and error-bound to a complex Hermitian system of linear equations, packed storage nagf linsys complex symm solve
E04DIE	21	Computes the solution, estimated condition number and error-bound to a complex symmetric system of linear equations
F04DJF	21	nagf_linsys_complex_symm_packed_solve Computes the solution, estimated condition number and error-bound to a complex symmetric system of linear equations, packed storage
F04FEF	15	nagf_linsys_real_toeplitz_yule Solution of the Yule-Walker equations for real symmetric positive definite Toeplitz matrix, one right-hand side
F04FFF	15	nagf_linsys_real_toeplitz_solve Solution of real symmetric positive definite Toeplitz system, one right-hand
F04JGF	8	side $nagf_linsys_real_gen_solve$ Least squares (if rank $= n$ ) or minimal least squares (if rank $< n$ ) solution
F04LEF	11	of $m$ real equations in $n$ unknowns, $m \ge n$ nagf_linsys_real_tridiag_fac_solve Solution of real tridiagonal simultaneous linear equations (coefficient matrix
F04LHF	13	already factorized by F01LEF) nagf_linsys_real_blkdiag_fac_solve
		Solution of real almost block diagonal simultaneous linear equations (coefficient matrix already factorized by F01LHF)

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F04MCF	8	nagf_linsys_real_posdef_vband_solve
		Solution of real symmetric positive definite variable-bandwidth
		simultaneous linear equations (coefficient matrix already factorized by
		F01MCF)
F04MEF	15	nagf linsys real toeplitz yule update
		Update solution of the Yule-Walker equations for real symmetric positive
		definite Toeplitz matrix
F04MFF	15	nagf linsys real toeplitz update
		Update solution of real symmetric positive definite Toeplitz system
F04QAF	11	nagf_linsys_real_gen_sparse_lsqsol
		Sparse linear least squares problem, $m$ real equations in $n$ unknowns
F04YAF	11	nagf_linsys_real_gen_lsq_covmat
		Covariance matrix for linear least squares problems, $m$ real equations in $n$
		unknowns
F04YDF	24	nagf_linsys_real_gen_norm_rcomm
		Norm estimation (for use in condition estimation), real rectangular matrix
F04ZDF	24	nagf_linsys_complex_gen_norm_rcomm
		Norm estimation (for use in condition estimation), complex rectangular
		matrix

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