## NAG Library Chapter Contents

## F04 - Simultaneous Linear Equations

F04 Chapter Introduction - a description of the Chapter and an overview of the algorithms available
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\begin{array}{lcl}\begin{array}{l}\text { Routine } \\
\text { Name }\end{array} & \begin{array}{c}\text { Mark of } \\
\text { Introduction }\end{array} & \begin{array}{l}\text { Purpose }\end{array} \\
\text { F04ABF } & 2 & \begin{array}{l}\text { nagf_linsys_withdraw_real_posdef_solve_ref } \\
\text { Solution of real symmetric positive definite simultaneous linear equations } \\
\text { with multiple right-hand sides using iterative refinement (Black Box) }\end{array}
$$ <br>
Note: this routine is scheduled for withdrawal at Mark 28, see <br>
Advice on Replacement Calls for Withdrawn/Superseded Routines for <br>
further information. <br>
nagf_linsys_withdraw_real_square_solve_ref <br>
Solution of real simultaneous linear equations with multiple right-hand <br>
sides using iterative refinement (Black Box) <br>
Note: this routine is scheduled for withdrawal at Mark 28, see <br>
Advice on Replacement Calls for Withdrawn/Superseded Routines for <br>
further information. <br>

nagf_linsys_real_gen_lsqsol\end{array}\right]\)| Least squares solution of $m$ real equations in $n$ unknowns, rank |
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| F04AEF |


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


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

