

# NAG Fortran Library Chapter Contents

## F11 – Large Scale Linear Systems

**Note:** please refer to the Users' Note for your implementation to check that a routine is available.

### F11 Chapter Introduction

<b>Routine Name</b>	<b>Mark of Introduction</b>	<b>Purpose</b>
F11BDF	19	Real sparse nonsymmetric linear systems, setup for F11BEF
F11BEF	19	Real sparse nonsymmetric linear systems, preconditioned RGMRES, CGS, Bi-CGSTAB or TFQMR method
F11BFF	19	Real sparse nonsymmetric linear systems, diagnostic for F11BEF
F11BRF	19	Complex sparse non-Hermitian linear systems, setup for F11BSF
F11BSF	19	Complex sparse non-Hermitian linear systems, preconditioned RGMRES, CGS, Bi-CGSTAB or TFQMR method
F11BTF	19	Complex sparse non-Hermitian linear systems, diagnostic for F11BSF
F11DAF	18	Real sparse nonsymmetric linear systems, incomplete <i>LU</i> factorization
F11DBF	18	Solution of linear system involving incomplete <i>LU</i> preconditioning matrix generated by F11DAF
F11DCF	18	Solution of real sparse nonsymmetric linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, preconditioner computed by F11DAF
F11DDF	18	Solution of linear system involving preconditioning matrix generated by applying SSOR to real sparse nonsymmetric matrix
F11DEF	18	Solution of real sparse nonsymmetric linear system, RGMRES, CGS, Bi-CGSTAB, or TFQMR method, Jacobi or SSOR preconditioner (Black Box)
F11DKF	20	Real sparse nonsymmetric linear systems, line Jacobi preconditioner
F11DNF	19	Complex sparse non-Hermitian linear systems, incomplete <i>LU</i> factorization
F11DPF	19	Solution of complex linear system involving incomplete <i>LU</i> preconditioning matrix generated by F11DNF
F11DQF	19	Solution of complex sparse non-Hermitian linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, preconditioner computed by F11DNF (Black Box)
F11DRF	19	Solution of linear system involving preconditioning matrix generated by applying SSOR to complex sparse non-Hermitian matrix
F11DSF	19	Solution of complex sparse non-Hermitian linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, Jacobi or SSOR preconditioner Black Box
F11DXF	20	Complex sparse nonsymmetric linear systems, line Jacobi preconditioner
F11GAF*	17	Real sparse symmetric linear systems, setup for F11GBF
F11GBF*	17	Real sparse symmetric linear systems, preconditioned conjugate gradient or Lanczos
F11GCF*	17	Real sparse symmetric linear systems, diagnostic for F11GBF
F11GDF	20	Real sparse symmetric linear systems, setup for F11GEF
F11GEF	20	Real sparse symmetric linear systems, preconditioned conjugate gradient or Lanczos
F11GFF	20	Real sparse symmetric linear systems, diagnostic for F11GEF
F11GRF	20	Complex sparse Hermitian linear systems, setup for F11GSF
F11GSF	20	Complex sparse Hermitian linear systems, preconditioned conjugate gradient or Lanczos
F11GTF	20	Complex sparse Hermitian linear systems, diagnostic for F11GSF
F11JAF	17	Real sparse symmetric matrix, incomplete Cholesky factorization
F11JBF	17	Solution of linear system involving incomplete Cholesky preconditioning matrix generated by F11JAF
F11JCF	17	Solution of real sparse symmetric linear system, conjugate gradient/Lanczos method, preconditioner computed by F11JAF (Black Box)

F11JDF	17	Solution of linear system involving preconditioning matrix generated by applying SSOR to real sparse symmetric matrix
F11JEF	17	Solution of real sparse symmetric linear system, conjugate gradient/Lanczos method, Jacobi or SSOR preconditioner (Black Box)
F11JNF	19	Complex sparse Hermitian matrix, incomplete Cholesky factorization
F11JPF	19	Solution of complex linear system involving incomplete Cholesky preconditioning matrix generated by F11JNF
F11JQF	19	Solution of complex sparse Hermitian linear system, conjugate gradient/Lanczos method, preconditioner computed by F11JNF (Black Box)
F11JRF	19	Solution of linear system involving preconditioning matrix generated by applying SSOR to complex sparse Hermitian matrix
F11JSF	19	Solution of complex sparse Hermitian linear system, conjugate gradient/Lanczos method, Jacobi or SSOR preconditioner (Black Box)
F11MDF	21	Real sparse nonsymmetric linear systems, setup for F11MEF
F11MEF	21	<i>LU</i> factorization of real sparse matrix
F11MFF	21	Solution of real sparse simultaneous linear equations (coefficient matrix already factorized)
F11MGF	21	Estimate condition number of real matrix, matrix already factorized by F11MEF
F11MHF	21	Refined solution with error bounds of real system of linear equations, multiple right-hand sides
F11MKF	21	Real sparse nonsymmetric matrix matrix multiply, compressed column storage
F11MLF	21	1-norm, $\infty$ -norm, largest absolute element, real general matrix
F11MMF	21	Real sparse nonsymmetric linear systems, diagnostic for F11MEF
F11XAF	18	Real sparse nonsymmetric matrix vector multiply
F11XEF	17	Real sparse symmetric matrix vector multiply
F11XNF	19	Complex sparse non-Hermitian matrix vector multiply
F11XSF	19	Complex sparse Hermitian matrix vector multiply
F11ZAF	18	Real sparse nonsymmetric matrix reorder routine
F11ZBF	17	Real sparse symmetric matrix reorder routine
F11ZNF	19	Complex sparse non-Hermitian matrix reorder routine
F11ZPF	19	Complex sparse Hermitian matrix reorder routine

\* This routine is scheduled for withdrawal at Mark 22. See the document 'Advice on Replacement Calls for Withdrawn/Superseded Routines' for details of the recommended replacement routine.

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