NAG Library Chapter Contents

F11 – Large Scale Linear Systems

F11 Chapter Introduction

Routine Name	Mark of Introduction	Purpose
F11BDF	19	nagf_sparse_real_gen_basic_setup Real sparse nonsymmetric linear systems, setup for F11BEF
F11BEF	19	nagf_sparse_real_gen_basic_solver Real sparse nonsymmetric linear systems, preconditioned RGMRES, CGS, Bi-CGSTAB or TFQMR method
F11BFF	19	nagf_sparse_real_gen_basic_diag Real sparse nonsymmetric linear systems, diagnostic for F11BEF
F11BRF	19	nagf_sparse_complex_gen_basic_setup Complex sparse non-Hermitian linear systems, setup for F11BSF
F11BSF	19	nagf_sparse_complex_gen_basic_solver Complex sparse non-Hermitian linear systems, preconditioned RGMRES, CGS, Bi-CGSTAB or TFQMR method
F11BTF	19	nagf_sparse_complex_gen_basic_diag Complex sparse non-Hermitian linear systems, diagnostic for F11BSF
F11DAF	18	nagf_sparse_real_gen_precon_ilu Real sparse nonsymmetric linear systems, incomplete LU factorization
F11DBF	18	nagf_sparse_real_gen_precon_ilu_solve Solution of linear system involving incomplete LU preconditioning matrix generated by F11DAF
F11DCF	18	nagf_sparse_real_gen_solve_ilu Solution of real sparse nonsymmetric linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, preconditioner computed by F11DAF
F11DDF	18	nagf_sparse_real_gen_precon_ssor_solve Solution of linear system involving preconditioning matrix generated by applying SSOR to real sparse nonsymmetric matrix
F11DEF	18	nagf_sparse_real_gen_solve_jacssor Solution of real sparse nonsymmetric linear system, RGMRES, CGS, Bi-CGSTAB, or TFQMR method, Jacobi or SSOR preconditioner (Black Box)
F11DFF	24	nagf_sparse_real_gen_precon_bdilu Real sparse nonsymmetric linear system, incomplete LU factorization of local or overlapping diagonal blocks
F11DGF	24	nagf_sparse_real_gen_solve_bdilu Solution of real sparse nonsymmetric linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, incomplete LU block diagonal preconditioner computed by F11DFF
F11DKF	20	nagf_sparse_real_gen_precon_jacobi Real sparse nonsymmetric linear systems, line Jacobi preconditioner
F11DNF	19	nagf_sparse_complex_gen_precon_ilu Complex sparse non-Hermitian linear systems, incomplete LU factorization

F11DPF	19	nagf_sparse_complex_gen_precon_ilu_solve Solution of complex linear system involving incomplete LU preconditioning matrix generated by F11DNF
F11DQF	19	nagf_sparse_complex_gen_solve_ilu Solution of complex sparse non-Hermitian linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, preconditioner computed by F11DNF (Black Box)
F11DRF	19	nagf_sparse_complex_gen_precon_ssor_solve Solution of linear system involving preconditioning matrix generated by applying SSOR to complex sparse non-Hermitian matrix
F11DSF	19	nagf_sparse_complex_gen_solve_jacssor Solution of complex sparse non-Hermitian linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, Jacobi or SSOR preconditioner Black Box
F11DTF	24	nagf_sparse_complex_gen_precon_bdilu Complex sparse nonsymmetric linear system, incomplete LU factorization of local or overlapping diagonal blocks
F11DUF	24	nagf_sparse_complex_gen_solve_bdilu Solution of complex sparse nonsymmetric linear system, RGMRES, CGS, Bi-CGSTAB or TFQMR method, incomplete LU block diagonal preconditioner computed by F11DTF
F11DXF	20	nagf_sparse_complex_gen_precon_jacobi Complex sparse nonsymmetric linear systems, line Jacobi preconditioner
F11GDF	20	nagf_sparse_real_symm_basic_setup Real sparse symmetric linear systems, setup for F11GEF
F11GEF	20	nagf_sparse_real_symm_basic_solver Real sparse symmetric linear systems, preconditioned conjugate gradient or Lanczos method or the MINRES algorithm
F11GFF	20	nagf_sparse_real_symm_basic_diag Real sparse symmetric linear systems, diagnostic for F11GEF
F11GRF	20	nagf_sparse_complex_herm_basic_setup Complex sparse Hermitian linear systems, setup for F11GSF
F11GSF	20	nagf_sparse_complex_herm_basic_solver Complex sparse Hermitian linear systems, preconditioned conjugate gradient or Lanczos
F11GTF	20	nagf_sparse_complex_herm_basic_diag Complex sparse Hermitian linear systems, diagnostic for F11GSF
F11JAF	17	nagf_sparse_real_symm_precon_ichol Real sparse symmetric matrix, incomplete Cholesky factorization
F11JBF	17	nagf_sparse_real_symm_precon_ichol_solve Solution of linear system involving incomplete Cholesky preconditioning matrix generated by F11JAF
F11JCF	17	nagf_sparse_real_symm_solve_ichol Solution of real sparse symmetric linear system, conjugate gradient/Lanczos method, preconditioner computed by F11JAF (Black Box)
F11JDF	17	nagf_sparse_real_symm_precon_ssor_solve Solution of linear system involving preconditioning matrix generated by applying SSOR to real sparse symmetric matrix
F11JEF	17	nagf_sparse_real_symm_solve_jacssor Solution of real sparse symmetric linear system, conjugate gradient/Lanczos method, Jacobi or SSOR preconditioner (Black Box)

F11JNF	19	nagf_sparse_complex_herm_precon_ilu Complex sparse Hermitian matrix, incomplete Cholesky factorization
F11JPF	19	nagf_sparse_complex_herm_precon_ilu_solve Solution of complex linear system involving incomplete Cholesky preconditioning matrix generated by F11JNF
F11JQF	19	nagf_sparse_complex_herm_solve_ilu Solution of complex sparse Hermitian linear system, conjugate gradient/Lanczos method, preconditioner computed by F11JNF (Black Box)
F11JRF	19	nagf_sparse_complex_herm_precon_ssor_solve Solution of linear system involving preconditioning matrix generated by applying SSOR to complex sparse Hermitian matrix
F11JSF	19	nagf_sparse_complex_herm_solve_jacssor Solution of complex sparse Hermitian linear system, conjugate gradient/Lanczos method, Jacobi or SSOR preconditioner (Black Box)
F11MDF	21	nagf_sparse_direct_real_gen_setup Real sparse nonsymmetric linear systems, setup for F11MEF
F11MEF	21	nagf_sparse_direct_real_gen_lu LU factorization of real sparse matrix
F11MFF	21	nagf_sparse_direct_real_gen_solve Solution of real sparse simultaneous linear equations (coefficient matrix already factorized)
F11MGF	21	nagf_sparse_direct_real_gen_cond Estimate condition number of real matrix, matrix already factorized by F11MEF
F11MHF	21	nagf_sparse_direct_real_gen_refine Refined solution with error bounds of real system of linear equations, multiple right-hand sides
F11MKF	21	nagf_sparse_direct_real_gen_matmul Real sparse nonsymmetric matrix-matrix multiply, compressed column storage
F11MLF	21	nagf_sparse_direct_real_gen_norm 1-norm, ∞-norm, largest absolute element, real general matrix
F11MMF	21	nagf_sparse_direct_real_gen_diag Real sparse nonsymmetric linear systems, diagnostic for F11MEF
F11XAF	18	nagf_sparse_real_gen_matvec Real sparse nonsymmetric matrix vector multiply
F11XEF	17	nagf_sparse_real_symm_matvec Real sparse symmetric matrix vector multiply
F11XNF	19	nagf_sparse_complex_gen_matvec Complex sparse non-Hermitian matrix vector multiply
F11XSF	19	nagf_sparse_complex_herm_matvec Complex sparse Hermitian matrix vector multiply
F11ZAF	18	nagf_sparse_real_gen_sort Real sparse nonsymmetric matrix reorder routine
F11ZBF	17	nagf_sparse_real_symm_sort Real sparse symmetric matrix reorder routine
F11ZNF	19	nagf_sparse_complex_gen_sort Complex sparse non-Hermitian matrix reorder routine
F11ZPF	19	nagf_sparse_complex_herm_sort Complex sparse Hermitian matrix reorder routine