NAG Fortran Library Routine Document

F06SRF (ZHER2)

Note: before using this routine, please read the Users' Note for your implementation to check the interpretation of ***bold italicised*** terms and other implementation-dependent details.

1 Purpose

F06SRF (ZHER2) performs the Hermitian rank-2 update operation

$$A \leftarrow \alpha x y^H + \bar{\alpha} y x^H + A$$

where A is an n by n complex Hermitian matrix, x and y are n element complex vectors, and α is a complex scalar.

2 Specification

```
SUBROUTINE F06SRF (UPLO, N, ALPHA, X, INCX, Y, INCY, A, LDA)
INTEGER              N, INCX, INCY, LDA
complex*16           ALPHA, X(*), Y(*), A(LDA,*)
CHARACTER*1          UPLO
```

The routine may be called by its BLAS name ***zher2***.

3 Description

None.

4 References

None.

5 Parameters

1: UPLO – CHARACTER*1 *Input*

On entry: specifies whether the upper or lower triangular part of A is stored as follows:

if UPLO = 'U', the upper triangular part of A is stored;
if UPLO = 'L', the lower triangular part of A is stored.

Constraint: UPLO = 'U' or 'L'.

2: N – INTEGER *Input*

On entry: n, the order of the matrix A.

Constraint: N ≥ 0.

3: ALPHA – ***complex*16*** *Input*

On entry: the scalar α.

4: X$(*)$ – ***complex*16*** array *Input*

On entry: the vector x.

5: INCX – INTEGER *Input*

On entry: the increment in the subscripts of X between successive elements of x.

Constraint: INCX $\neq 0$.

6: Y$(*)$ – ***complex*16*** array *Input*

On entry: the vector y.

7: INCY – INTEGER *Input*

On entry: the increment in the subscripts of Y between successive elements of y.

Constraint: INCY $\neq 0$.

8: A(LDA,$*$) – ***complex*16*** array *Input/Output*

Note: the second dimension of the array A must be at least max$(1, \mathrm{N})$.

On entry: the n by n Hermitian matrix A. If UPLO $=$ 'U', the upper triangle of A must be stored and the elements of the array below the diagonal are not referenced; if UPLO $=$ 'L', the lower triangle of A must be stored and the elements of the array above the diagonal are not referenced.

On exit: the updated matrix A. The imaginary parts of the diagonal elements are set to zero.

9: LDA – INTEGER *Input*

On entry: the first dimension of the array A as declared in the (sub)program from which F06SRF (ZHER2) is called.

Constraint: LDA $\geq$ max$(1, \mathrm{N})$.

6 Error Indicators and Warnings

None.