

NAG Library Routine Document

F06SMF (ZGERU)

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

F06SMF (ZGERU) performs the rank-1 update operation

$$A \leftarrow \alpha xy^T + A,$$

where A is an m by n complex matrix, x is an m element complex vector, y is an n element complex vector, and α is a complex scalar.

2 Specification

```
SUBROUTINE F06SMF(M, N, ALPHA, X, INCX, Y, INCY, A, LDA)
  INTEGER          M, N, INCX, INCY, LDA
  complex*16      ALPHA, X(*), Y(*), A(LDA,*)
```

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

3 Description

None.

4 References

None.

5 Parameters

- | | | |
|----|--|--------------|
| 1: | M – INTEGER | <i>Input</i> |
| | <i>On entry:</i> m , the number of rows of the matrix A . | |
| | <i>Constraint:</i> $M \geq 0$. | |
| 2: | N – INTEGER | <i>Input</i> |
| | <i>On entry:</i> n , the number of columns of the matrix A . | |
| | <i>Constraint:</i> $N \geq 0$. | |
| 3: | ALPHA – complex*16 | <i>Input</i> |
| | <i>On entry:</i> the scalar α . | |
| 4: | X(*) – complex*16 array | <i>Input</i> |
| | Note: the dimension of the array X must be at least $1 + (M - 1) INCX $. | |
| | <i>On entry:</i> the incremented array X must contain the m element vector x . | |
| 5: | INCX – INTEGER | <i>Input</i> |
| | <i>On entry:</i> the increment in the subscripts of X between successive elements of x . | |
| | <i>Constraint:</i> $INCX \neq 0$. | |

- 6: $Y(*)$ – **complex*16** array *Input*
Note: the dimension of the array Y must be at least $1 + (N - 1)|\text{INCY}|$.
On entry: the incremented array Y must contain the n element vector y .
- 7: INCY – INTEGER *Input*
On entry: the increment in the subscripts of Y between successive elements of y .
Constraint: $\text{INCY} \neq 0$.
- 8: $A(\text{LDA},*)$ – **complex*16** array *Input/Output*
Note: the second dimension of the array A must be at least N .
On entry: the m by n matrix A .
On exit: the updated matrix A .
- 9: LDA – INTEGER *Input*
On entry: the first dimension of the array A as declared in the (sub)program from which F06SMF (ZGERU) is called.
Constraint: $\text{LDA} \geq \max(1, M)$.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.
