

# NAG Library Routine Document

## F06GCF (ZAXPY)

**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

F06GCF (ZAXPY) adds a scaled complex vector to an unscaled complex vector.

### 2 Specification

```
SUBROUTINE F06GCF (N, ALPHA, X, INCX, Y, INCY)
  INTEGER          N, INCX, INCY
  COMPLEX (KIND=nag_wp) ALPHA, X(*), Y(*)
```

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

### 3 Description

F06GCF (ZAXPY) performs the operation

$$y \leftarrow \alpha x + y$$

where  $x$  and  $y$  are  $n$ -element complex vectors scattered with stride INCX and INCY respectively, and  $\alpha$  is a complex scalar.

### 4 References

Lawson C L, Hanson R J, Kincaid D R and Krogh F T (1979) Basic linear algebra subprograms for Fortran usage *ACM Trans. Math. Software* **5** 308–325

### 5 Parameters

- |    |   |              |
|----|---|--------------|
| 1: | N – INTEGER   | <i>Input</i> |
|    | <i>On entry:</i> $n$ , the number of elements in $x$ and $y$ .  |              |
| 2: | ALPHA – COMPLEX (KIND=nag_wp)   | <i>Input</i> |
|    | <i>On entry:</i> the scalar $\alpha$ .  |              |
| 3: | X(*) – COMPLEX (KIND=nag_wp) array  | <i>Input</i> |
|    | <b>Note:</b> the dimension of the array X must be at least $\max(1, 1 + (N - 1) \times  \text{INCX} )$ .        |              |
|    | <i>On entry:</i> the $n$ -element vector $x$ .  |              |
|    | If $\text{INCX} > 0$ , $x_i$ must be stored in $X(1 + (i - 1) \times \text{INCX})$ , for $i = 1, 2, \dots, N$ . |              |
|    | If $\text{INCX} < 0$ , $x_i$ must be stored in $X(1 - (N - i) \times \text{INCX})$ , for $i = 1, 2, \dots, N$ . |              |
|    | Intermediate elements of X are not referenced.  |              |
| 4: | INCX – INTEGER  | <i>Input</i> |
|    | <i>On entry:</i> the increment in the subscripts of X between successive elements of $x$ .                      |              |

5: Y(\*) – COMPLEX (KIND=nag\_wp) array *Input/Output*

**Note:** the dimension of the array Y must be at least  $\max(1, 1 + (N - 1) \times |\text{INCY}|)$ .

*On entry:* the  $n$ -element vector  $y$ .

If  $\text{INCY} > 0$ ,  $y_i$  must be stored in  $Y(1 + (i - 1) \times \text{INCY})$ , for  $i = 1, 2, \dots, N$ .

If  $\text{INCY} < 0$ ,  $y_i$  must be stored in  $Y(1 - (N - i) \times \text{INCY})$ , for  $i = 1, 2, \dots, N$ .

Intermediate elements of Y are not referenced.

*On exit:* the updated vector  $y$ .

6: INCY – INTEGER *Input*

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

## 6 Error Indicators and Warnings

None.

## 7 Accuracy

Not applicable.

## 8 Parallelism and Performance

Not applicable.

## 9 Further Comments

None.

## 10 Example

None.

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