

# NAG Library Routine Document

## F06GAF (ZDOTU)

**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

F06GAF (ZDOTU) computes the scalar product of two complex vectors.

### 2 Specification

```
FUNCTION F06GAF (N, X, INCX, Y, INCY)
  COMPLEX (KIND=nag_wp) F06GAF
  INTEGER                N, INCX, INCY
  COMPLEX (KIND=nag_wp) X(*), Y(*)
```

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

### 3 Description

F06GAF (ZDOTU) returns, via the function name, the value of the scalar product

$$x^T y$$

where  $x$  and  $y$  are  $n$ -element complex vectors scattered with stride INCX and INCY respectively.

### 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 Arguments

- 1: N – INTEGER *Input*  
*On entry:*  $n$ , the number of elements in  $x$  and  $y$ .
- 2: X(\*) – COMPLEX (KIND=nag\_wp) array *Input*  
**Note:** the dimension of the array X must be at least  $\max(1, 1 + (N - 1) \times |\text{INCX}|)$ .  
*On entry:* 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.
- 3: INCX – INTEGER *Input*  
*On entry:* the increment in the subscripts of X between successive elements of  $x$ .
- 4: Y(\*) – COMPLEX (KIND=nag\_wp) array *Input*  
**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.

5:  $\text{INCY} - \text{INTEGER}$

*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

F06GAF (ZDOTU) is not threaded in any implementation.

## 9 Further Comments

None.

## 10 Example

None.

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