

NAG Library Routine Document

F06HPF

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

F06HPF applies a real plane rotation to two complex vectors.

2 Specification

```
SUBROUTINE F06HPF (N, X, INCX, Y, INCY, C, S)
```

```
INTEGER N, INCX, INCY
COMPLEX (KIND=nag_wp) X(*), Y(*), C, S
```

3 Description

F06HPF applies a complex plane rotation to two n -element complex vectors x and y :

$$\begin{pmatrix} x^T \\ y^T \end{pmatrix} \leftarrow \begin{pmatrix} c & s \\ -\bar{s} & \bar{c} \end{pmatrix} \begin{pmatrix} x^T \\ y^T \end{pmatrix}.$$

4 References

None.

5 Parameters

- 1: N – INTEGER *Input*
On entry: n , the number of elements in x and y .
- 2: X(*) – COMPLEX (KIND=nag_wp) array *Input/Output*
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.
On exit: the transformed vector x stored in the array elements used to supply the original vector x .
 Intermediate elements of X are unchanged.
- 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/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 $INCY < 0$, y_i must be stored in $Y(1 - (N - i) \times INCY)$, for $i = 1, 2, \dots, N$.

Intermediate elements of Y are not referenced.

On exit: the transformed vector y .

Intermediate elements of Y are unchanged.

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|----|---|--------------|
| 5: | INCY – INTEGER | <i>Input</i> |
| | <i>On entry</i> : the increment in the subscripts of Y between successive elements of y . | |
| 6: | C – COMPLEX (KIND=nag_wp) | <i>Input</i> |
| | <i>On entry</i> : the value c , the cosine of the rotation. | |
| 7: | S – COMPLEX (KIND=nag_wp) | <i>Input</i> |
| | <i>On entry</i> : the value s , the sine of the rotation. | |

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.
