

NAG Library Routine Document

F06UHF

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

F06UHF returns, via the function name, the value of the 1-norm, the ∞ -norm, the Frobenius norm, or the maximum absolute value of the elements of a complex n by n symmetric band matrix.

2 Specification

```
FUNCTION F06UHF (NORM, UPLO, N, K, AB, LDAB, WORK)
REAL (KIND=nag_wp) F06UHF
INTEGER                N, K, LDAB
REAL (KIND=nag_wp)    WORK(*)
COMPLEX (KIND=nag_wp) AB(LDAB,*)
CHARACTER(1)          NORM, UPLO
```

3 Description

None.

4 References

None.

5 Arguments

- 1: NORM – CHARACTER(1) *Input*
- On entry:* specifies the value to be returned.
- NORM = '1' or 'O'
The 1-norm.
- NORM = 'I'
The ∞ -norm (= the 1-norm for a symmetric matrix).
- NORM = 'F' or 'E'
The Frobenius (or Euclidean) norm.
- NORM = 'M'
The value $\max_{i,j} |a_{ij}|$ (not a norm).
- Constraint:* NORM = '1', 'O', 'I', 'F', 'E' or 'M'.
- 2: UPLO – CHARACTER(1) *Input*
- On entry:* specifies whether the upper or lower triangular part of A is stored.
- UPLO = 'U'
The upper triangular part of A is stored.
- UPLO = 'L'
The lower triangular part of A is stored.
- Constraint:* UPLO = 'U' or 'L'.

- 3: N – INTEGER *Input*
On entry: n , the order of the matrix A .
 When $N = 0$, F06UHF returns zero.
Constraint: $N \geq 0$.
- 4: K – INTEGER *Input*
On entry: k , the number of subdiagonals or superdiagonals of the matrix A .
Constraint: $K \geq 0$.
- 5: AB(LDAB,*) – COMPLEX (KIND=nag_wp) array *Input*
Note: the second dimension of the array AB must be at least N .
On entry: the n by n symmetric band matrix A .
 The matrix is stored in rows 1 to $k + 1$, more precisely,
 if UPLO = 'U', the elements of the upper triangle of A within the band must be stored with
 element A_{ij} in $AB(k + 1 + i - j, j)$ for $\max(1, j - k) \leq i \leq j$;
 if UPLO = 'L', the elements of the lower triangle of A within the band must be stored with
 element A_{ij} in $AB(1 + i - j, j)$ for $j \leq i \leq \min(n, j + k)$.
- 6: LDAB – INTEGER *Input*
On entry: the first dimension of the array AB as declared in the (sub)program from which
 F06UHF is called.
Constraint: $LDAB \geq K + 1$.
- 7: WORK(*) – REAL (KIND=nag_wp) array *Workspace*
Note: the dimension of the array WORK must be at least $\max(1, N)$ if $NORM = '1', 'O'$ or $'I'$, and
 at least 1 otherwise.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Parallelism and Performance

F06UHF is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
