

NAG Fortran Library Routine Document

F06PEF (DSPMV)

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

F06PEF (DSPMV) performs the matrix-vector operation

$$y \leftarrow \alpha Ax + \beta y,$$

where A is an n by n real symmetric matrix stored in packed form, x and y are n element real vectors, and α and β are real scalars.

2 Specification

```
SUBROUTINE F06PEF (UPLO, N, ALPHA, AP, X, INCX, BETA, Y, INCY)
  INTEGER          N, INCX, INCY
  double precision ALPHA, AP(*), X(*), BETA, Y(*)
  CHARACTER*1     UPLO
```

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

3 Description

None.

4 References

None.

5 Parameters

- 1: UPLO – CHARACTER*1 *Input*
On entry: specifies whether the upper or lower triangular part of A is stored as follows:
 if UPLO = 'U', the upper triangular part of A is stored;
 if UPLO = 'L', the lower triangular part of A is stored.
Constraint: UPLO = 'U' or 'L'.
- 2: N – INTEGER *Input*
On entry: n , the order of the matrix A .
Constraint: $N \geq 0$.
- 3: ALPHA – **double precision** *Input*
On entry: the scalar α .
- 4: AP(*) – **double precision** array *Input*
Note: the dimension of the array AP must be at least $\max(1, N \times (N + 1)/2)$.
On entry: the n by n symmetric matrix A , packed by columns. More precisely, if UPLO = 'U', the upper triangle of A must be stored with element a_{ij} in $AP(i + j(j - 1)/2)$ for $i \leq j$;

if UPLO = 'L', the lower triangle of A must be stored with element a_{ij} in $AP(i + (2n - j)(j - 1)/2)$ for $i \geq j$.

- 5: $X(*)$ – *double precision* array *Input*
On entry: the vector x .
- 6: INCX – INTEGER *Input*
On entry: the increment in the subscripts of X between successive elements of x .
Constraint: $INCX \neq 0$.
- 7: BETA – *double precision* *Input*
On entry: the scalar β .
- 8: $Y(*)$ – *double precision* array *Input/Output*
On entry: the vector y . If BETA = 0, Y need not be set.
On exit: the updated vector y .
- 9: INCY – INTEGER *Input*
On entry: the increment in the subscripts of Y between successive elements of y .
Constraint: $INCY \neq 0$.

6 Error Indicators and Warnings

None.
