

NAG C Library Function Document

zhpmv (f06sec)

1 Purpose

zhpmv (f06sec) performs the matrix-vector operation

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

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

2 Specification

```
#include <nag.h>
```

```
#include <nagf06.h>
```

```
void zhpmv (MatrixTriangle uplo, Integer n, Complex alpha, const Complex ap[],
            const Complex x[], Integer incx, Complex beta, Complex y[], Integer incy)
```

3 Arguments

- 1: **uplo** – MatrixTriangle *Input*
On entry: specifies whether the upper or lower triangular part of A is stored as follows:
 if **uplo** = **UpperTriangle**, the upper triangular part of A is stored;
 if **uplo** = **LowerTriangle**, the lower triangular part of A is stored.
Constraint: **uplo** = **UpperTriangle** or **LowerTriangle**.
- 2: **n** – Integer *Input*
On entry: n , the order of the matrix A .
Constraint: **n** \geq 0.
- 3: **alpha** – Complex *Input*
On entry: the scalar α .
- 4: **ap**[*dim*] – const Complex *Input*
Note: the dimension, *dim*, of the array **ap** must be at least $\mathbf{n(n+1)/2}$.
On entry: the n by n Hermitian matrix A , packed by rows. More precisely,
 if **uplo** = **UpperTriangle**, the upper triangle of A must be stored with element a_{ij} in
 ap[$j - 1 + (2n - i)(i - 1)/2$] for $i \leq j$;
 if **uplo** = **LowerTriangle**, the lower triangle of A must be stored with element a_{ij} in
 ap[$j - 1 + i(i - 1)/2$] for $j \leq i$.
- 5: **x**[**n**] – const Complex *Input*
On entry: the incremented array **x** must contain the n element 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** – Complex *Input*
On entry: the scalar β .
- 8: **y[n]** – Complex *Input/Output*
On entry: the incremented array **y** must contain the n element vector y .
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** $\neq 0$.

4 Error Indicators and Warnings

If a function is called with an invalid argument then an error message is output on stderr, giving the name of the function and the number of the first invalid argument, and execution is terminated.
