

NAG Library Routine Document

F06ERF (DDOTI)

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

F06ERF (DDOTI) computes the scalar product of a sparse real vector, stored in compressed form, with a real vector.

2 Specification

```
FUNCTION F06ERF (NZ, X, INDX, Y)
REAL (KIND=nag_wp) F06ERF
INTEGER                NZ, INDX(*)
REAL (KIND=nag_wp) X(*), Y(*)
```

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

3 Description

F06ERF (DDOTI) returns, via the function name, the value of the scalar product

$$x^T y = x(1) \times y(\text{indx}(1)) + x(2) \times y(\text{indx}(2)) + \cdots + x(\text{nz}) \times y(\text{indx}(\text{nz}))$$

where x is a sparse real vector, stored in compressed form and y is a real vector in full storage format.

4 References

Dodson D S, Grimes R G and Lewis J G (1991) Sparse extensions to the Fortran basic linear algebra subprograms *ACM Trans. Math. Software* **17** 253–263

5 Arguments

- | | | |
|----|---|--------------|
| 1: | NZ – INTEGER | <i>Input</i> |
| | <i>On entry:</i> the number of nonzeros in the sparse vector x . | |
| 2: | X(*) – REAL (KIND=nag_wp) array | <i>Input</i> |
| | Note: the dimension of the array X must be at least max(1,NZ). | |
| | <i>On entry:</i> the nonzero elements of the sparse vector x . | |
| 3: | INDX(*) – INTEGER array | <i>Input</i> |
| | Note: the dimension of the array INDX must be at least max(1,NZ). | |
| | <i>On entry:</i> INDX(i) must contain the index of X(i) in the sparse vector x , for $i = 1, 2, \dots, \text{NZ}$. | |
| 4: | Y(*) – REAL (KIND=nag_wp) array | <i>Input</i> |
| | Note: the dimension of the array Y must be at least $\max_k \{\text{INDX}(k)\}$. | |
| | <i>On entry:</i> the vector y . Only elements corresponding to indices in INDX are accessed. | |

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Parallelism and Performance

F06ERF (DDOTI) is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
