

NAG Library Routine Document

F06ETF (DAXPYI)

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

F06ETF (DAXPYI) adds a scaled sparse real vector, stored in compressed form, to an unscaled real vector.

2 Specification

```
SUBROUTINE F06ETF (NZ, A, X, INDX, Y)
  INTEGER          NZ, INDX(*)
  REAL (KIND=nag_wp) A, X(*), Y(*)
```

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

3 Description

F06ETF (DAXPYI) performs the operation

$$y \leftarrow \alpha x + y$$

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

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: | A – REAL (KIND=nag_wp) | <i>Input</i> |
| | <i>On entry:</i> the scalar α . | |
| 3: | X(*) – REAL (KIND=nag_wp) array | <i>Input</i> |
| | Note: the dimension of the array X must be at least $\max(1, \text{NZ})$. | |
| | <i>On entry:</i> the nonzero elements of the sparse vector x . | |
| 4: | INDX(*) – INTEGER array | <i>Input</i> |
| | Note: the dimension of the array INDX must be at least $\max(1, \text{NZ})$. | |
| | <i>On entry:</i> INDX(i) must contain the index of X(i) in the sparse vector x , for $i = 1, 2, \dots, \text{NZ}$. | |
| | <i>Constraint:</i> the indices must be distinct. | |

5: Y(*) – REAL (KIND=nag_wp) array

Input/Output

Note: the dimension of the array Y must be at least $\max_k\{\text{INDX}(k)\}$.

On entry: the vector y . Only elements corresponding to indices in INDX are accessed.

On exit: the updated vector y .

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Parallelism and Performance

F06ETF (DAXPYI) is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
