NAG Fortran Library Routine Document

D03RZF

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

D03RZF is designed to be used in conjunction with D03RBF. It can be called from the user-supplied MONITR subroutine to obtain the number of grid points and their (x, y) co-ordinates on a solution grid.

2 Specification

```
SUBROUTINE DO3RZF(LEVEL, NLEV, XMIN, YMIN, DXB, DYB, LGRID, ISTRUC,
1                  NPTS, X, Y, LENXY, IFAIL)
INTEGER           LEVEL, NLEV, LGRID(*), ISTRUC(*), NPTS, LENXY, IFAIL
real              XMIN, YMIN, DXB, DYB, X(LENXY), Y(LENXY)
```

3 Description

D03RZF extracts the number of grid points and their (x, y) co-ordinates on a specific solution grid produced by D03RBF. It must be called only from within the user-supplied subroutine MONITR. The parameters NLEV, XMIN, YMIN, DXB, DYB, LGRID and ISTRUC to MONITR must be passed unchanged to D03RZF.

4 References

None.

5 Parameters

1: LEVEL – INTEGER *Input*

   On entry: the grid level at which the co-ordinates are required.

   Constraint: $1 \leq \text{LEVEL} \leq \text{NLEV}$.

2: NLEV – INTEGER *Input*
3: XMIN – *real* *Input*
4: YMIN – *real* *Input*
5: DXB – *real* *Input*
6: DYB – *real* *Input*
7: LGRID(∗) – INTEGER array *Input*
8: ISTRUC(∗) – INTEGER array *Input*

   On entry: NLEV, XMIN, YMIN, DXB, DYB, LGRID and ISTRUC as supplied to MONITR must be passed unchanged to D03RZF.

9: NPTS – INTEGER *Output*

   On exit: the number of grid points in the grid level LEVEL.

10: X(LENXY) – *real* array *Output*
11: Y(LENXY) – *real* array *Output*

   On exit: $X(i)$ and $Y(i)$ contain the (x, y) co-ordinates respectively of the ith grid point, for $i = 1, 2, \ldots, \text{NPTS}$.

12:    LENXY – INTEGER   *Input*

On entry: the dimension of the arrays X and Y as declared in MONITR.

Constraint: LENXY $\geq$ NPTS.

13:    IFAIL – INTEGER   *Input/Output*

On entry: IFAIL must be set to 0, -1 or 1. Users who are unfamiliar with this parameter should refer to Chapter P01 for details.

On exit: IFAIL = 0 unless the routine detects an error (see Section 6).

For environments where it might be inappropriate to halt program execution when an error is detected, the value -1 or 1 is recommended. If the output of error messages is undesirable, then the value 1 is recommended. Otherwise, for users not familiar with this parameter the recommended value is 0. **When the value -1 or 1 is used it is essential to test the value of IFAIL on exit.**

6   Error Indicators and Warnings

If on entry IFAIL = 0 or -1, explanatory error messages are output on the current error message unit (as defined by X04AAF).

Errors or warnings detected by the routine:

IFAIL = 1

On entry, LEVEL < 1,
or   LEVEL > NLEV.

IFAIL = 2

The dimension of the arrays X and Y is too small for the requested grid level, i.e., LENXY < NPTS.

7   Accuracy

Not applicable.

8   Further Comments

None.

9   Example

See Section 9 of the document for D03RBF.