NAG Library Function Document

nag_dae_ivp_dassl_linalg (d02npc)

1   Purpose

nag_dae_ivp_dassl_linalg (d02npc) is a setup function which you must call prior to nag_dae_ivp_dassl_gen (d02nec) and after a call to nag_dae_ivp_dassl_setup (d02mwc), if the Jacobian is to be considered as having a banded structure.

2   Specification

```
#include <nag.h>
#include <nagd02.h>
void nag_dae_ivp_dassl_linalg (Integer neq, Integer ml, Integer mu,
     Integer icom[], Integer licom, NagError *fail)
```

3   Description

A call to nag_dae_ivp_dassl_linalg (d02npc) specifies that the Jacobian to be used is banded in structure. If nag_dae_ivp_dassl_linalg (d02npc) is not called before a call to nag_dae_ivp_dassl_gen (d02nec) then the Jacobian is assumed to be full.

4   References

None.

5   Arguments

1:    **neq** – Integer   *Input*

   On entry: the number of differential-algebraic equations to be solved.

   Constraint: $1 \leq \mathbf{neq}$.

2:    **ml** – Integer   *Input*

   On entry: ml, the number of subdiagonals in the band.

   Constraint: $0 \leq \mathbf{ml} \leq \mathbf{neq} - 1$.

3:    **mu** – Integer   *Input*

   On entry: mu, the number of superdiagonals in the band.

   Constraint: $0 \leq \mathbf{mu} \leq \mathbf{neq} - 1$.

4:    **icom**[**licom**] – Integer   *Communication Array*

   icom is used to communicate details of the integration from nag_dae_ivp_dassl_setup (d02mwc) and details of the banded structure of the Jacobian to nag_dae_ivp_dassl_gen (d02nec).

5:    **licom** – Integer   *Input*

   On entry: the dimension of the array **icom**.

   Constraint: $\mathbf{licom} \geq 50 + \mathbf{neq}$.

6:     **fail** – NagError *   *Input/Output*

The NAG error argument (see Section 3.6 in the Essential Introduction).

6   Error Indicators and Warnings

NE_BAD_PARAM

On entry, argument $\langle value \rangle$ had an illegal value.

NE_INITIALIZATION

Either the initialization function has not been called prior to the first call of this function or the communication array has become corrupted.

NE_INT

On entry, **licom** is too small: **licom** $= \langle value \rangle$.

On entry, **ml** $= \langle value \rangle$.
Constraint: **ml** ≥ 0.

On entry, **mu** $= \langle value \rangle$.
Constraint: **mu** ≥ 0.

On entry, **neq** $= \langle value \rangle$.
Constraint: **neq** ≥ 1.

NE_INT_2

On entry, **ml** $= \langle value \rangle$ and **neq** $= \langle value \rangle$.
Constraint: **ml** $\leq$ **neq** $- 1$.

On entry, **mu** $= \langle value \rangle$ and **neq** $= \langle value \rangle$.
Constraint: **mu** $\leq$ **neq** $- 1$.

NE_INTERNAL_ERROR

An internal error has occurred in this function. Check the function call and any array sizes. If the call is correct then please contact NAG for assistance.

7   Accuracy

Not applicable.

8   Parallelism and Performance

Not applicable.

9   Further Comments

None.

10   Example

See Section 10 in nag_dae_ivp_dassl_gen (d02nec) and nag_dae_ivp_dassl_setup (d02mwc).