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: $1 \leq$ **neq**.

2: **ml** – Integer *Input*

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

Constraint: $0 \leq$ **ml** $\leq$ **neq** $- 1$.

3: **mu** – Integer *Input*

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

Constraint: $0 \leq$ **mu** $\leq$ **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: **licom** $\geq 50 +$ **neq**.

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

The NAG error argument (see Section 2.7 in How to Use the NAG Library and its Documentation).

6 Error Indicators and Warnings

NE_ALLOC_FAIL

Dynamic memory allocation failed.
See Section 2.3.1.2 in How to Use the NAG Library and its Documentation for further information.

NE_BAD_PARAM

On entry, argument ⟨*value*⟩ 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** = ⟨*value*⟩.

On entry, **ml** = ⟨*value*⟩.
Constraint: **ml** ≥ 0.

On entry, **mu** = ⟨*value*⟩.
Constraint: **mu** ≥ 0.

On entry, **neq** = ⟨*value*⟩.
Constraint: **neq** ≥ 1.

NE_INT_2

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

On entry, **mu** = ⟨*value*⟩ and **neq** = ⟨*value*⟩.
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.

An unexpected error has been triggered by this function. Please contact NAG.
See Section 2.7.6 in How to Use the NAG Library and its Documentation for further information.

NE_NO_LICENCE

Your licence key may have expired or may not have been installed correctly.
See Section 2.7.5 in How to Use the NAG Library and its Documentation for further information.

7 Accuracy

Not applicable.

8 Parallelism and Performance

nag_dae_ivp_dassl_linalg (d02npc) is not threaded in any implementation.

9 Further Comments

None.

10 Example

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