

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
<i>On entry:</i> the number of differential-algebraic equations to be solved.
<i>Constraint:</i> $1 \leq \mathbf{neq}$. | Input |
| 2: | ml – Integer
<i>On entry:</i> <i>ml</i> , the number of subdiagonals in the band.
<i>Constraint:</i> $0 \leq \mathbf{ml} \leq \mathbf{neq} - 1$. | Input |
| 3: | mu – Integer
<i>On entry:</i> <i>mu</i> , the number of superdiagonals in the band.
<i>Constraint:</i> $0 \leq \mathbf{mu} \leq \mathbf{neq} - 1$. | Input |
| 4: | icom[licom] – Integer <i>Communication Array</i>
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
<i>On entry:</i> the dimension of the array icom .
<i>Constraint:</i> $\mathbf{licom} \geq 50 + \mathbf{neq}$. | Input |

6: **fail** – NagError *

Input/Output

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

6 Error Indicators and Warnings

NE_ALLOC_FAIL

Dynamic memory allocation failed.

See Section 3.2.1.2 in the Essential Introduction for further information.

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, **m1** = $\langle value \rangle$.

Constraint: **m1** ≥ 0 .

On entry, **mu** = $\langle value \rangle$.

Constraint: **mu** ≥ 0 .

On entry, **neq** = $\langle value \rangle$.

Constraint: **neq** ≥ 1 .

NE_INT_2

On entry, **m1** = $\langle value \rangle$ and **neq** = $\langle value \rangle$.

Constraint: **m1** \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.

An unexpected error has been triggered by this function. Please contact NAG.

See Section 3.6.6 in the Essential Introduction for further information.

NE_NO_LICENCE

Your licence key may have expired or may not have been installed correctly.

See Section 3.6.5 in the Essential Introduction for further information.

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).
