NAG Toolbox for MATLAB

d02za

1   Purpose

d02za calculates the weighted norm of the local error estimate from inside a (sub)program **monitr** called from an integrator in sub-chapter D02M/N (e.g., see d02nb).

2   Syntax

```
[result, ifail] = d02za(v, w, 'neq', neq)
```

3   Description

d02za is for use with the forward communication integrators d02nb, d02nc, d02nd, d02ng, d02nh and d02nj and the reverse communication integrators d02nm and d02nn. It must be used only inside (sub)program **monitr** (if this option is selected) for the forward communication functions or on the equivalent return for the reverse communication functions. It may be used to evaluate the norm of the scaled local error estimate, $\|v\|$, where the weights used are contained in w and the norm used is as defined by an earlier call to the integrator setup function (d02mv, d02nv or d02nw). Its use is described under the description of **monitr** in the specifications for the forward communication integrators mentioned above.

4   References

None.

5   Parameters

5.1   Compulsory Input Parameters

1:    **v**(**neq**) – **double array**

The vector, the weighted norm of which is to be evaluated by d02za. **v** is calculated internally by the integrator being used.

2:    **w**(**neq**) – **double array**

The weights, calculated internally by the integrator, to be used in the norm evaluation.

5.2   Optional Input Parameters

1:    **neq** – **int32 scalar**

Default: The dimension of the arrays **v**, **w**. (An error is raised if these dimensions are not equal.)

the number of differential equations, as defined for the integrator being used.

5.3   Input Parameters Omitted from the MATLAB Interface

None.

5.4   Output Parameters

1:    **result** – **double scalar**

The result of the function.

2:     **ifail – int32 scalar**

> 0 unless the function detects an error (see Section 6).

6   Error Indicators and Warnings

Note: d02za may return useful information for one or more of the following detected errors or warnings.

ifail $= 1$

> The value of the norm would either overflow or is close to overflowing. A value close to the square root of the largest number on the computer is returned.

7   Accuracy

The result is calculated close to *machine precision* except in the case when the function exits with **ifail** $= 1$.

8   Further Comments

d02za should only be used within (sub)program **monitr** associated with the integrators in sub-chapter D02M/N (e.g., see d02nb). Its use and only valid calling sequence are fully documented in the description of **monitr** in the function documents for the integrators.

9   Example

None.