
Macro-order CALC_STABILITE

1 Goal

Lmacro-order has CALC_STABILITE allows to determine the stability of periodic solutions obtained by MODE_NON_LINE, while basing itself on the theory of Floquet, by a diagram of temporal integration and a calculation with the eigenvalues. At exit, it updates the column STABILITY table of the periodic solutions.

This macro-order can enrich an existing concept or produces a new concept of the type table_container.

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2 Syntax

```
resu_out [table_container] = CALC_STABILITE (  
  ◊ reuse = resu_out,  
  
  ◆ MODE_NON_LINE = resu_in, [table_container]  
  
  ◊ SCHEMA_TEMPS = _F (  
    ◊ DIAGRAM = 'NEWMARK', [DEFECT]  
# Keywords only associated with the diagram 'NEWMARK':  
    ◊ NB_INST = /1000, [DEFECT]  
    /nbinst, [R]  
  ),  
  
  ◊ TOLERANCE = /1.E-2, [DEFECT]  
  /tol, [R]  
  
  ◊ FILTER = _F (  
    ◆ /NUME_ORDRE = num_ordr, [I]  
    /FREQ_MIN = freq_min, [R]  
# If keywords 'FREQ_MIN' present:  
    ◆ FREQ_MAX = freq_max, [R]  
    ◊ PRECISION = /1.E-3, [R]  
    /prec, [R]  
  ),  
  
  ◊ INFORMATION = /1, [DEFECT]  
  /2,  
  )
```

3 Operands

3.1 Keyword **MODE_NON_LINE**

◆ `MODE_NON_LINE`

Concept of the type `table_container` resulting from a calculation with the operator `MODE_NON_LINE`.

3.2 Keyword **SCHEMA_TEMPS**

◆ `SCHEMA_TEMPS`

Under this keyword factor, one can inform a diagram of integration with, possibly, its parameters. The diagrams available are to be declared under the operand `DIAGRAM`.

3.2.1 Operand **DIAGRAM**

◆ `DIAGRAM = 'NEWMARK'`

Choice of the algorithm of temporal integration. For the moment, only the diagram of Newmark is possible. It is an Schéma of implicit temporal integration allowing the solution of ordinary differential equation linear. It is the diagram by default.

3.2.2 Operand **NB_INST**

◆ `NB_INST`

The resolution is carried out over one period of a given periodic solution. The value `nbinst` allows to define the discretization for the resolution. The more the number of `ddl`s is raised, the more `nbinst` must be large. By default `nbinst = 1000`.

3.3 Keyword **TOLERANCE**

◆ `TOLERANCE`

`tol` is the value of control on the error of the coefficients of Floquet γ_i , which makes it possible to rule on the stability of the periodic solution. If $\forall i, |\gamma_i| > (1 + tol)$ then the periodic solution is unstable if not it is stable.

3.4 Keyword **FILTER**

◆ `FILTER`

Filter the periodic solutions on which the calculation of stability will be carried out. By default, the calculation of stability is carried out on all the periodic solutions of `resu_in`.

3.4.1 Operand **NUME_ORDRE**

◆ `NUME_ORDRE`

This keyword makes it possible to calculate the stability on a list of sequence number. The keyword is not valid if the keyword `FREQ_MIN` is present.

3.4.2 Operand **FREQ_MIN**

◆ `FREQ_MIN`

This keyword makes it possible to define the lower limit of the beach of frequency [`freq_min`, `freq_max`]. Stability is calculated if the frequency of the periodic solution is in this beach of frequency. The keyword is not valid if the keyword `NUME_ORDRE` is present.

3.4.3 Operand **FREQ_MAX**

◇ FREQ_MAX

This keyword makes it possible to define the upper limit of the beach of frequency [`freq_min` , `freq_max`]. Stability is calculated if the frequency of the periodic solution is in this beach of frequency.

3.4.4 Operand **PRECISION**

◇ PRECISION

This keyword (optional) makes it possible to give a precision of the terminals of the beach of frequency [`freq_min` , `freq_max`].

3.5 Keyword **INFORMATION**

Entirety allowing to specify the level of impression in the file `MESSAGE` .

If `INFO=1` , one displays if the solution is stable or unstable for the sequence number of the periodic solution.

If `INFO=2` , one also displays the absolute error and relative of resolution by the diagram of temporal integration, as well as the greatest coefficient of Floquet.