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.

Contents

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 ddls 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.