Operator DEFI_FONC_FLUI

1 Goal

To define a profile rate of flow fluid along a beam. Profiles corresponding to “standard” profiles resulting from results experimental and used within the framework of a dynamic calculation with taking into account of forces fluid-rubber bands.

Speeds are calculated with the nodes for which one searches in the concept grid the value of the associated curvilinear X-coordinate.

Currently, it is not possible to apply a profile speed defined by DEFI_FONC_FLUI that on a structure whose meshs are of type 'SEG2'. The produced concept is of type function (parameter 'ABSC', curvilinear X-coordinate)

2 Syntax

```
F  [function] = DEFI_FONC_FLUI   (


          ♦  GRID          =  my,                          [grid]
          ♦  GROUP_NO_INIT    =  gni,                   [grno]
          ♦  GROUP_NO_FIN     =  gnf,                   [grno]
          ♦  QUICKLY   =  _F (

# If PROFIL=' UNIFORME'
          ♦  PROFILE       =  /  'UNIFORM',
                ◊  VALE       =  /  1. ,                        [DEFECT]
                                 /  vale,                  [R]

# If PROFIL=' LEONARD'
          ♦  PROFILE       =  /  'LEONARD',
                ◊  NB_BAV     =  /  0,                     [DEFECT]
                                  / 2,
                                 /  3,
                          ),

             ◊  Interpol      =  /  'FLAX',                    [DEFECT]
                                 /  'LOG',

             ◊  PROL_GAUCHE   =  /  'EXCLUDED',                [DEFECT]
                                 /  'LINEAR',
                                 /  'CONSTANT',

             ◊  PROL_DROITE   =  /  'EXCLUDED',                [DEFECT]
                                 /  'LINEAR',
                                 /  'CONSTANT',


             ◊  INFORMATION         =  /  1,                      [DEFECT]
                                 /  2,

             ◊  TITLE         =     title,                 [TXM]

                                  ) ;
```

3 Operands

3.1 Operand GRID

♦ GRID = my

Name of the grid for which the curvilinear X-coordinate is defined.

3.2 Operands GROUP_NO_INIT and GROUP_NO_FIN

♦ GROUP_NO_INIT = gni, [grno]
♦ GROUP_NO_FIN = gnf, [grno]

The function is defined on the whole of the grid. Operands 'GROUP_NO_INIT' and 'GROUP_NO_FIN' allow to define the enforcement zone of the profile speed. Apart from this zone, the value of the function is worthless.

3.3 Keyword QUICKLY

♦ QUICKLY

Keyword factor, it makes it possible to define the profile speed.

♦ PROFILE

This operand, associated with the operands VALE and NB_BAV, allows to define a "standard" profile: 'UNIFORM' or 'LEONARD'.

/ ◊ VALE = vale

Allows to define the level of the function, if the standard profile is 'UNIFORM'.

/ ◊ NB_BAV

If the profile is of type 'LEONARD', NB_BAV a "standard" profile stored in a catalogue defines.

Note:

BAV (Barre Anti Vibratoire) is a terminology related to the tubes of steam generator. NB_BAV corresponds to the number of anti-vibratory bars being in the zone of obtaining the profile.

3.4 Operand Interpol

◊ Interpol

Type of interpolation of the function enters the values of parameter of the field of definition.

- 'FLAX': linear,
- 'LOG': logarithmic curve,

3.5 Operands PROL_GAUCHE and PROL_DROITE

◊ PROL_GAUCHE / PROL_DROITE

Define the type of prolongation on the left (respectively on the right) of the field of definition of the parameter.

- 'LINEAR': the function is prolonged on the left (on the right) by of a the same line segment slope than on the lower terminal (higher) of the field of definition of the parameter,
- 'EXCLUDED' : the extrapolation of the function apart from the field of definition of the parameter is prohibited,
- 'CONSTANT': the function is prolonged on the left (on the right) by the value which it takes on the lower terminal (higher) field of definition of the parameter.

3.6 Operand INFORMATION

◊ INFORMATION

Level of impression.

- INFORMATION = 1: pas d' impression,
- INFORMATION = 2: one prints in the file MESSAGE the name of the function, the number of points of definition, the name of the parameter, the name of the result, options of prolongation and interpolation and the first 10 values of the function, in the order ascending of the parameter.

3.7 Operand TITLE

◊ TITLE = title

Argument of type text defining the title attached to the concept function at exit.

4 Presentation of the standard profiles speed

They are defined in a form discretized in θ (varying angle in degrees of 0. to 180.) - [Figure 4-a], [Figure 4-b] and [Figure 4-c].

Thus, it is possible starting from the equation [éq 4-1] to apply these profiles to a field defined in curvilinear X-coordinate.

$$v(s_i)=\frac{\alpha_i\cdot\gamma_i+\beta_i}{v_{moy}} \qquad \text{éq 4-1}$$

with
$$\begin{cases}\alpha_i=\dfrac{v_{k+1}-v_k}{\theta_{k+1}-\theta_k}\\ \gamma_i=180\left(\dfrac{s_i-s_{ni}}{s_{nf}-s_{ni}}\right)\\ \beta_i=\dfrac{v_k\theta_{k+1}-v_{k+1}\theta_k}{\theta_{k+1}-\theta_k}\end{cases}$$

s_i, s_{ni}, s_{nf} are respectively the curvilinear X-coordinate of the point running, of initial node and of final node who define the enforcement zone.

K: index in the table of the discretized function.

$$v_{moy}=\frac{\sum_{i=1}^{N}\left(\alpha_i\cdot\gamma_i+\beta_i\right)}{N}$$

NR: many points of discretization of the enforcement zone.

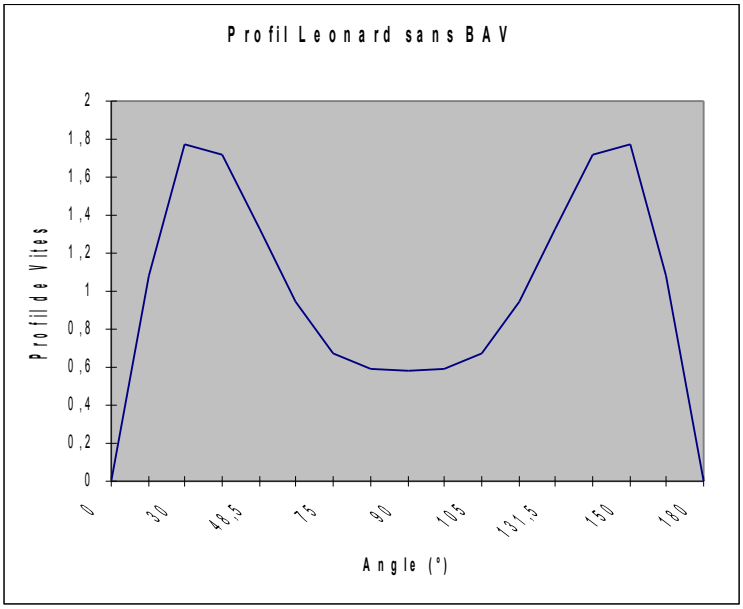

Figure 4-a: Profile speed - NB_BAV = 0

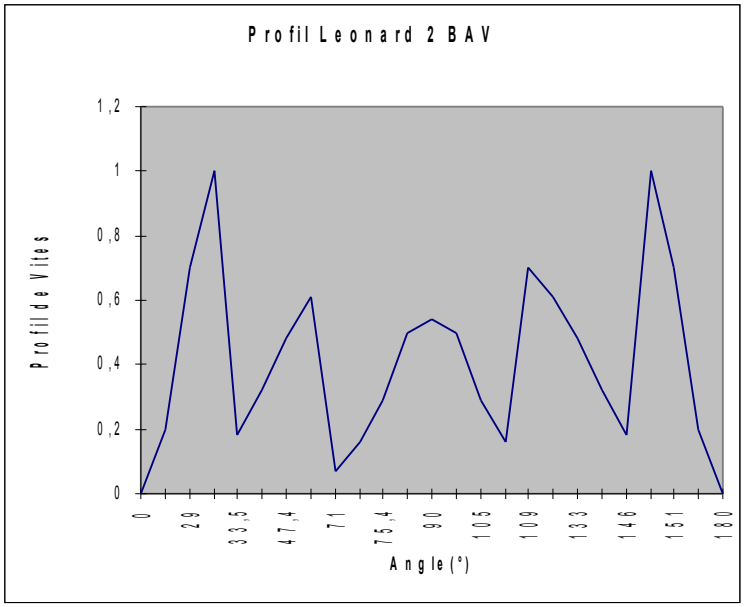

Figure 4-b: Profile speed - NB_BAV = 2

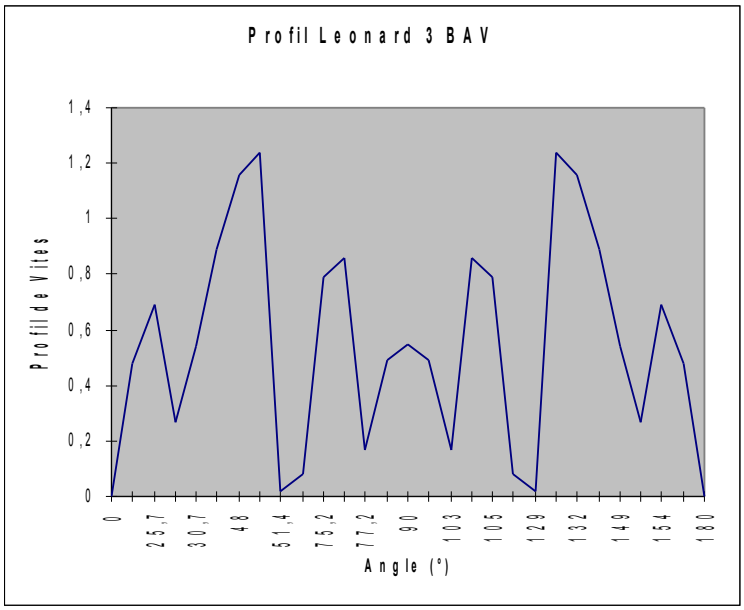

Figure 4-c: Profile speed - NB_BAV = 3

5 Bibliography

[1] NR. GAY: Flustru Version 2.0 - general Presentation. Note of use - source FORTRAN of the software. Technical note EDF/DER HT-32/93.05A.