Operator DEFI_FONC_FLUI

1 Drank

To define a profile rate of flow fluid along a beam. Profiles corresponding to “standard” profiles resulting of results experimental and used in the frame from a dynamic computation with taking into account of forces fluid-elastics.

The velocities are calculated with the nodes for which one searches in the concept mesh the value of the associated curvilinear abscisse.

Currently, it is possible to apply a profile velocity defined by DEFI_FONC_FLUI only to one structure of which meshes are of type "SEG2". The product concept is of standard function (parameter "ABSC", curvilinear abscisse)

2 Syntax

```
F   [function] = DEFI_FONC_FLUI   (


          ♦MAILLAGE=ma                ,                              [mesh]
          ♦NOEUD_INIT=ni              ,                              [node]
          ♦NOEUD_FIN=nf               ,                              [node]

          ♦VITE=_F             (

# If PROFIL=' UNIFORME'
          ♦PROFIL=/               "UNIFORME",
                ◊VALE=/1                  .,                         [DEFAULT]
                                  /vale  ,                    [R]

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

             ◊INTERPOL=/                  "LIN",                     [DEFAULT]
                                  /   "LOG",
                                  /   "NON",

             "            EXCLUDED" ◊PROL_GAUCHE=/,
[DEFAULT]
                                  /   "LINEAIRE",
                                  /   "CONSTANT",

             EXCLUDED             ◊PROL_DROITE=/"",
[DEFAULT]
                                  /   "LINEAIRE",
                                  /   "CONSTANT",


             ◊INFO=/1                    ,                            [DEFAULT]
                                  /2  ,

             ◊TITER=titer                ,                            [TXM]

                                   ) ;
```

3 Operands

3.1 Operand MAILLAGE

♦MAILLAGE = my

Name of the mesh for which the curvilinear abscisse is defined.

3.2 Operands NOEUD_INIT and NOEUD_FIN

♦NOEUD_INIT = nor / NOEUD_FIN = nf

the function is defined on the group of the mesh. Nodes "INIT" and "FIN" make it possible to define the zone of application of the profile velocity. Apart from this zone, the value of the function is null.

3.3 Key word QUICKLY

♦VITE

Factor key word, it makes it possible to define the profile velocity.

♦PROFIL

This operand, associated with operands VALE and NB_BAV, makes it possible to define a "standard" profile: "UNIFORME" or "LEONARD".

/◊VALE = vale

Makes it possible to define the level of the function, if the standard profile is "UNIFORME".

/◊NB_BAV

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

Note:

BAV (Vibratory Anti Bar) 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 Standard operand

INTERPOL

◊INTERPOL of interpolation of the function enters the values of parameter of the field of definition.

- "LIN": linear,
- "LOG": logarithmic curve,
- "NON": one does not interpolate (and thus the program will stop if one asks for the value of the function for a value of the parameter for which it was not defined).

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.

- "LINEAIRE": the function is prolonged on the left (on the right) by of a the same line segment slope than with the lower limit (higher) of the field of definition of the parameter,
- "EXCLU" : 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 with the lower limit (higher) field of definition of the parameter.

3.6 Operand INFO

◊INFO

Level of printing.

- INFO = 1: no printing,
- INFO = 2: one prints in the message file the name of the function, the number of points of definition, the name of the parameter, the name of result, the options of prolongation and interpolation and the first 10 values of the function, in the order ascending of the parameter.

3.7 Operand TITER

◊TITER = title

Argument of type text defining the title attached to the concept function in output.

4 Presentation of the standard profiles velocity

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 from the equation [éq 4-1] to apply these profiles to a field defined in curvilinear abscisse.

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

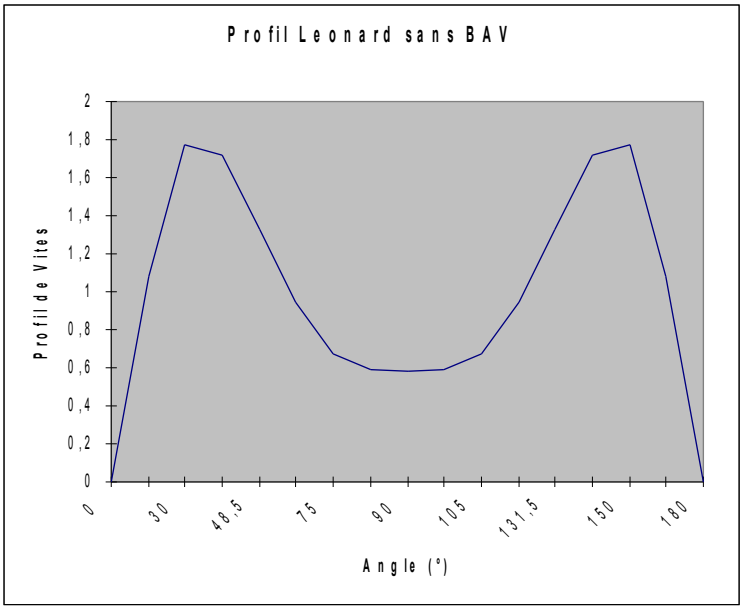
with
$$\begin{cases}\alpha_i=\dfrac{v_{k+1}-v_k}{\theta_{k+1}-\theta_k}\\ \gamma_i=180\left(\dfrac{s_i-s_{ni}}{s_{nf}-s_{ni}}\right)\\ \beta_i=\dfrac{v_k\theta_{k+1}-v_{k+1}\theta_k}{\theta_{k+1}-\theta_k}\end{cases}$$

s_i, s_{ni}, s_{nf} is respectively the curvilinear abscisse of the current point, `THE NOEUD_INIT` and `THE NOEUD_FIN` which define the enforcement zone.

K: index in the table of the discretized function.

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

N: many points of discretization of the enforcement zone.



Appear 4-a: Profile velocity - NB_BAV = 0

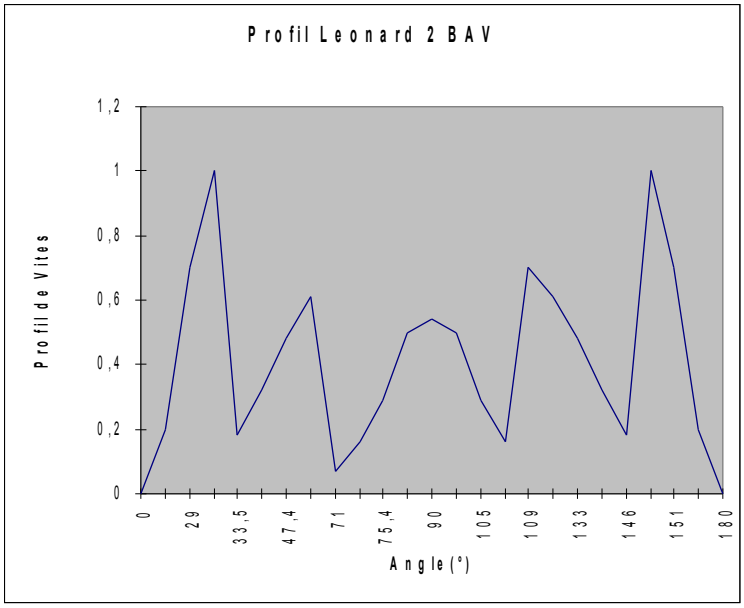


Figure 4-b: Profile velocity - NB_BAV = 2

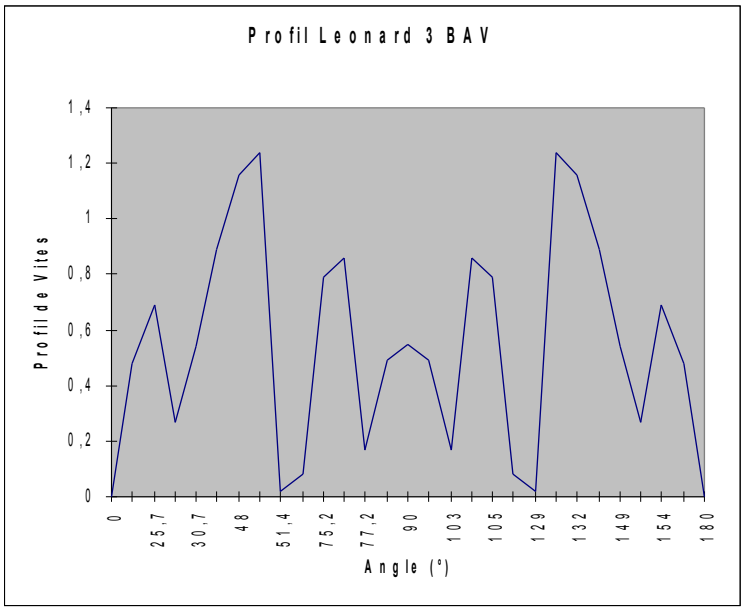


Figure 4-c: Profile velocity - NB_BAV = 3

5 Bibliography

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