

User Manuel
Booklet U4.2- : Meshing
Document : U4.21.01

Operator *LIRE_MAILLAGE*

1 Aim

To create a meshing by reading in a file. The file to read must be in "ASTER" format or in "MED" format. For the other formats (IDEAS et GIBI), you should utilise the commands `PRE_IDEAS` or `PRE_GIBI` beforehand.

To produce a data structure of type maillage.

Important remark :

You can verify the quality of the meshing read (after `LIRE_MAILLAGE`), by using the `MACR_INFO_MAIL` command [U7.03.02].

2 Syntax

```
ma [maillage] = LIRE_MAILLAGE

(
  ◇ FORMAT = / 'ASTER' , [DEFAULT]
              / 'MED' ,
  ◇ UNITE = / 20 , [DEFAULT]
            / i , [I]
  ◇ VERI_MAIL = _F (
                  ◇ APLAT = / 1.D-3 , [DEFAULT]
                    / ap , [R]
                  ◇ VERIF = / 'OUI' , [DEFAULT]
                    / 'NON' ,
                  ),
  ◇ ABSC_CURV = _F ( TOUT = / 'NON' , [DEFAULT]
                    / 'OUI' ,
                    ),
  ◇ INFO = / 1 , [DEFAULT]
           / 2 ,
)
)
```

3 Operands

3.1 Operand **FORMAT**

This keyword is used to specify the file format to read. Currently 2 formats are available : 'ASTER' et 'MED'.

The 'ASTER' format is described in [U3.01.00]

The 'MED' format is described in [U7.01.21.]

3.2 Operand **UNITE**

◇ UNITE = i

Logical unit number of the meshing file. Unit 20 by default.

3.3 Operand **VERI_MAIL**

The keyword **VERI_MAIL** triggers 3 checks on the meshing :

- absence of orphan nodes,
- absence of coincident meshes,
- absence of severely flattened meshes.

If these checks are not satisfied, the code emits an alarme.

By default (i.e. in the absence of the keyword **VERI_MAIL**), the checks are made. If the user wants to avoid these checks, he writes :

```
VERI_MAIL = _F (VERIF = 'NON' , ) ,
```

A node is declared orphan if it does not belong to the connectivity of any mesh. A mesh is declared coincident if 2 meshes (or more) have connectivities formed by the same list of nodes.

The keyword **APLAT** = ap permits alarms to be broadcast when the meshing contains severely flattened meshes.

The flattening of a mesh is defined as the ratio A_{min}/A_{max} where A_{min} and A_{max} are the shorter and the longer lengths of the mesh sides. The names of the meshes whose flatness is less than ap will be printed in the file 'MESSAGE'.

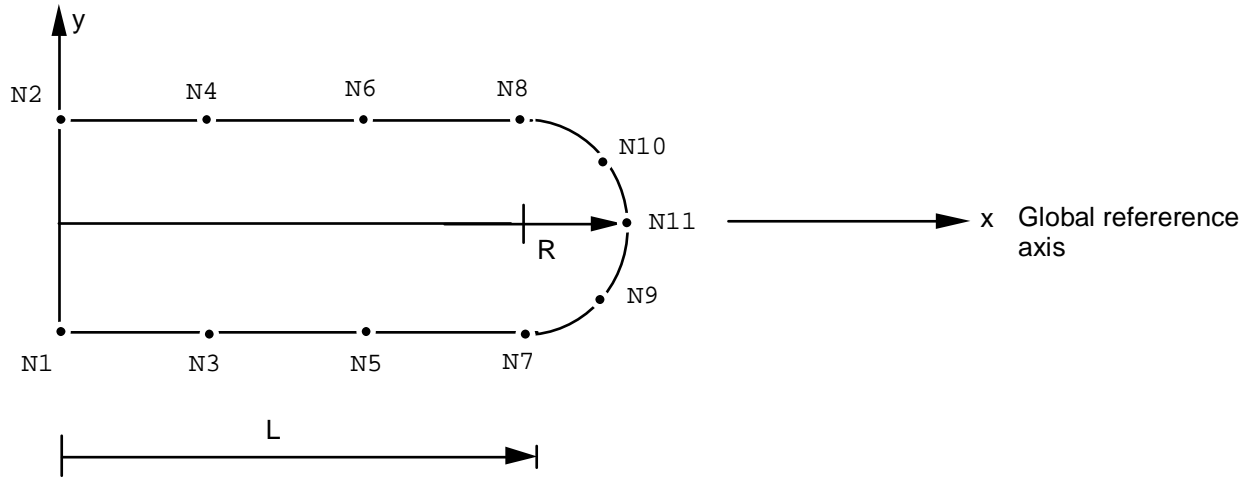
Other quality criteria for the meshing are available via the **MACR_INFO_MAIL** command [U7.03.02].

3.4 Operand **ABS_CURV**

◇ ABS_CURV = _F (TOUT = 'OUI') ,

Calculate a curvi-linear abscissa for the assembled meshes **SEG2** of the meshing. The curvi-linear abscissa is associated with the first and the second node of each mesh in the direction of the route.

This option is necessary, for example, in order to perform a modal calculation for a tube with external and internal fluid, when the density of the external fluid is defined as a function of the curvilinear abscissa.



All the meshes of the meshing must be of type 'SEG2'.

The origin mesh is the first mesh encountered, during the reading of the meshing file, having only one consecutive mesh (mesh N1 N3).

The final mesh is the last mesh encountered in the direction of the route having only one consecutive mesh. (mesh N4 N2).

If there is more than one path between the first and the last mesh, the calculation is impossible.

The curvi-linear abscissa is defined as the sum of the right-hand sides connecting the nodes :

$$\text{for } k \text{ meshes : } S_k = \sum_{i=2}^k \| \mathbf{x}_i - \mathbf{x}_{i-1} \|$$

3.5 Operande INFO

◇ INFO = / 1 , [DEFAULT]
 / 2 ,

Level of printing.

If : INFO = 1

- title of the meshing,
- number of nodes,
- number of meshes,
- number of node groups and for each one of them its name and the number of nodes in the group,
- number of mesh groups and for each one of them its name and the number of meshes in the group.

If : INFO = 2 we print in addition to the information of INFO = 1 :

List of nodes	number, name, coordinates,
List of meshes	number, name, type, node names,
List of node groups	number, name, number of nodes, node names,
List of mesh groups	number, name, number of meshes, mesh names.