Operator CALC_CHAM_ELEM

1 Goal

To calculate an elementary field at the points of Gauss containing the coordinates and the weight of the points of Gauss.

To calculate an elementary field of heat flux and acoustic pressure, starting from already calculated fields of type cham_no_*.

2 Syntax

```
chamel    [cham_elem_*] = CALC_CHAM_ELEM
      (  ♦  MODEL     =  Mo,                          [model]
         ◊  CARA_ELEM    =  carac  ,                     [cara_elem]
         ◊  ACCE         =  acce   ,                     [cham_no]
         ◊  INST         =  /  inst,                     [R]
                            /  0. ,                        [DEFECT]

            #  Selection of the meshs concerned with calculation
            ◊  /  ALL=  'YES',                          [DEFECT]
               /  GROUP_MA = l_grma,                    [l_gr_maille]


            #  thermal options:

            /  OPTION =  /  'FLUX_ELNO',
                         /  'FLUX_ELGA',
               ♦  TEMP = temp,                             [cham_no_TEMP_R]
               ♦  CHAM_MATER   =  chmater,                 [cham_mater]
               ◊  MODE_FOURIER =  /  nh,                   [I]
                                  /  0,                    [DEFECT]

            #  acoustic options:

            /  OPTION =  /  'PRAC_ELNO',
               ♦  CLOSE = near,                            [cham_no_PRAC_R]

            #  calculation of the coordinates and the weights of the points
         of Gauss

            /  OPTION=   'COOR_ELGA',
            );
```

type of produced field: [cham_elem_*] with:

If OPTION: then [*] - >

```
#  thermal options:

            FLUX_ELGA                                  FLUX_R
            FLUX_ELNO                                  FLUX_R

#  acoustic options:

            PRAC_ELNO                                  PRAC_R

#  other options

            COOR_ELGA                                  GEOM_R
```

3 Operands

3.1 Operands MODEL / CARA_ELEM

♦ MODEL = Mo,

Name of the model on which the option is calculated.

◊ CARA_ELEM = carac,

Elementary characteristics associated with the model Mo, if it contains elements of structure or if the isoparametric elements are affected of a local reference mark of anisotropy.

3.1 Selection of the meshs concerned with calculation

Keywords ALL = 'YES' and GROUP_MA allow the user to choose the meshs on which it wishes to do his elementary calculations of postprocessing.

/ ALL = 'YES'

All the meshs (carrying finite elements) will be treated. It is the value by default.

/ GROUP_MA = l_grma

Only meshs included in l_grma will be treated.

3.2 Operands ACCE / INST

◊ ACCE

Unutilised keyword which starts the following error message:
To take into account the terms of inertia, it is preferable to use the order CALC_CHAMP. The keyword ACCE is not treated and the results are likely to be false.

◊ INST

Value of the moment allowing to evaluate possible functions in the parameters materials for the calculation of the heat flux.

3.3 Thermal options

The options of elementary calculation in thermics can be calculated starting from a field of temperature:

♦ TEMP = temp

For these calculations one needs the material field associated with the model Mo :

♦ CHAM_MATER = chmater,

The options available are:

| 'FLUX_ELGA',
| 'FLUX_ELNO',
Their significance is given in [U4.81.04].

In the case of modelings AXIS_FOURIER and PLAN_FOURIER, one can specify the number of harmonic by the keyword : MODE_FOURIER.

3.4 Acoustic options

The options of elementary calculation in acoustics can be calculated starting from a complex field of pressure:

♦ CLOSE = near

The option available is:

| 'PRAC_ELNO'
Calculation of the real and imaginary parts of the field of pressure by element to the nodes.

3.5 Option COOR_ELGA

Calculation of the coordinates and the weights of the points of Gauss of each element.

4 Examples of calculations with CALC_CHAM_ELEM

4.1 Flow with the nodes starting from the field of temperature temp as an axisymmetric FOURIER mode 1

```
epsno = CALC_CHAM_ELEM

          (  MODEL =   moaxfour,     TEMP = temp,
             CHAM_MATER=  chmater,
             OPTION =  'FLUX_ELNO', MODE_FOURIER = 1,
          );
```