Code_Aster

Titre : Macro-commande MACR_ECLA_PG
Responsable : Jean-Pierre LEFEBVRE

Version default

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Clé : U4.44.14   Révision : 8544

Macro-command `MACR_ECLA_PG`

1   Drank

To allow a visualization of the fields Gauss points without lissage nor interpolation.
The principle of this command is to burst each element of the model in as many small elements it has of Gauss points. Each subelement then carries a constant field by mesh: the value of the Gauss point.

Product a data structure `result` and `a mesh`.

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2 Syntax

```
MACR_ECLA_PG        (

        # product concepts by the macro-command:
        ♦  RESULTAT=CO                  ( " resu_2 ") *,
[sd_resultat]
        ♦MAILLAGE             =CO ("my") *,                [mesh]

        # operands compulsory:
        ♦    RESU_INIT=resu_1              ,           [sd_resultat]
        ♦    MODELE_INIT=modele            ,           [model]
        ♦    NOM_CHAM=             | "SIEF_ELGA",
                                   | "VARI_ELGA",
                                   | "SIEF_ELGA",
                                   | "FLUX_ELGA",
                                   | "… ELGA…",

        # optional geometrical parameters:
        ◊SHRINK=/                    HS,            [R8]
                        /  0.9,                     [DEFAULT]

        ◊TAILLE_MIN=/                MT,            [R8]
                        /0 . ,                      [DEFAULT]

        possible   #Sélection of a subset of elements to be visualized:
        ◊/TOUT             =      `OUI',          [DEFAULT]
          /MAILLE          =lma           ,        [l_maille]
          /GROUP_MA        =lgma        ,          [l_gr_maille]

        #Sélection    of the sequence numbers:
        ◊/TOUT_ORDRE       =      ' OUI',          [DEFAULT]
          /NUME_ORDRE      =l_nuor        ,        [l_I]
          /LISTE_ORDRE     =l_numo        ,        [listis]
        /   .   /INST    =l_inst        ,          [l_R]
              /LIST_INST    =l_inst        ,       [listr8]
        ◊  |  accuracy  =     prec,
                            /1.0E-6,               [DEFAULT]
              | CRITERE     =     "RELATIF",       [DEFAULT]
                            /"ABSOLU"


               )
```

*Syntaxiquement , the product concepts by the command must be obligatorily written:
CO ("xxxx")

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3 Operands

3.1 General information

the command transforms `SD_resultat` (and its `subjacent` mesh) into a SD_resultat `news` and a new `mesh.`
Meshes of the initial mesh are burst in smaller meshes: a mesh by Gauss point. This news meshes all is disjoined (i.e they are not connected between them).
The value of a field on a Gauss point is then assigned to all the nodes of the small mesh which is associated for him.
The SD `_resultat produced` is thus a little particular because the fields (which keep their original name ELGA `)` `are` actually fields at nodes! Such

a data structure is intended above all for a visualization (after IMPR_RESU `)`. But one can also consider other postprocessings: POST `_RELEVE`, PROJ_CHAMP `,…` Operands

3.2 RESU_INIT ♦

RESU_INIT : resu_1 Name

of result with post-treating Operands

3.3 MODELE_INIT ♦

MODELE_INIT : Mo Name

of the model associated with result the resu `_1.` Operand
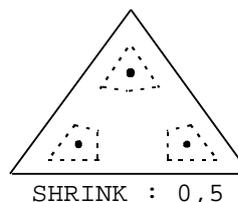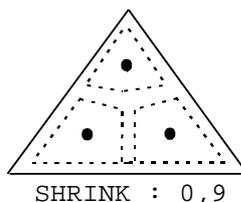
3.4 NOM _CHAMP ♦

NOM_CHAM : Symbolic name

of (or of) the fields to post-treating. Note:

One

treats only the fields by elements with the points of integration (standard ELGA `)`, *the restrictions (checked by Aster) are: -*
the fields must be real -
the fields "at subpoints" (multi-layer shells for example) are not taken into account. Operand

3.5 SHRINK ◊

SHRINK = HS homothetic

Factor of reduction allowing to ensure to it not interpenetration of meshes. Operand

SHRINK : 0,9   SHRINK : 0,5

- Point de Gauss

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3.6 TAILLE_MIN ◊

```
TAILLE_MIN    = MT This
```

makes it possible to fix the minimal size on a side of an element. If this size is not reached, one proceeds to a geometrical transformation (affinity along the too small side). The interest is to be able to display results on very stretched elements (like the elements of joint). By default , MT is worth 0. :   the geometry of the elements is not modified. Operand

3.7 RESULTAT ♦

```
RESULTAT    = CO ("resu_2") Name
```

of the SD result definite on the new mesh on which the fields will be transferred. Operand

3.8 MAILLAGE ♦

```
MAILLAGE    = CO ("my") my
```

is the name of the mesh associated with resu _2. This name is necessary for visualization (command IMPR_RESU). Operands

3.9 TOUT /GROUP_MA/MESH ◊

```
/TOUT      = "YES", [DEFAULT      ] This
```

key word makes it possible to carry out the operation on all meshes mesh. /GROUP_MA

```
= lgma, This
```

key word makes it possible to carry out the operation on a list of mesh groups of the mesh. / MAILLE

```
=lma   , This
```

key word makes it possible to carry out the operation on a list of meshes of the mesh. Operands

3.10 TOUT_ORDRE /NUME_ORDRE/LIST_ORDRE/INST/LIST_INST/accuracy/CRITERE Selection

in a data structure result [U 4.71.00]. Remarks

3.11 on certain diagrams of Gauss points

the principle of this command is to cut out meshes mesh in as many subelements (of simple form) that there is of Gauss points and to associate each value of field ELGA with the subelement which corresponds to him (see for example the drawing of paragraph 3.5). It

is thus necessary to know to cut out an element in as many subelements (triangle, quadrilateral, tetrahedron,…) that there exists of Gauss points in the diagram of integration. It is unfortunately not always possible and it was necessary to adapt for certain diagrams. For example

, for the diagram with 5 Gauss points of the tetrahedrons, one cut out the tetrahedron in 6 subelements (4 tetrahedrons and 2 pyramids). The value of the 5th Gauss point is affected with the 2 pyramidal subelements. The meeting of these 2 pyramids forms actually octahedral which is not a kind of mesh not recognized of the mesh generators or usual visualiseurs.

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The case of the pyramids with 27 Gauss points is much more problematic: There
- exist 12 Gauss points which is located "outwards" pyramid. It is thus impossible to visualize them without "overflowing" on the close elements. One decides "to forget them" purely and simply. Remain
- 15 interior points then. We did not know to differently cut out the pyramid than in 8 subelements (4 hexahedrons and 4 pyramids). Consequently, we visualize only the values of 8 Gauss points (out of the 27 of the diagram). Visualization

4   example

4.1   of a field of result to Gauss points on some mesh groups MACR

```
_ECLA_PG (RESU_INIT  = U2, MODELS   = MO, GROUP_MA  = ("G1", "G7"), NOM
            _CHAM= ("SIEF_ELGA", "VARI_ELGA"), RESULTAT
            = CO  ("U2B"), MAILLAGE  = CO ("MA2B"),)  IMPR_RESU

(FORMAT  = ' IDEAS', UNITE=38, RESU
            =_F ( MAILLAGE=MA2B      , RESULTAT=U2B      ,),)
```