Code_Aster

Version default

Titre : Procédure IMPR_RESU au format 'CASTEM'
Responsable : Mathieu COURTOIS

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Clé : U7.05.11   Révision : 10881

Procedure `IMPR_RESU` with format "CASTEM"

1 Drank

To write a mesh and/or the results of a computation on a file with format "CASTEM".

Currently this procedure makes it possible to write with the choice:

- a mesh,
- fields at nodes (of static displacements, temperatures, eigen modes, modes,…),
- fields by elements with the nodes (of stresses, generalized forces, local variables…), if these fields by elements do not have under points.

For the concepts of the type `result`, one can print only part of information, by selecting the fields and the sequence numbers which one wishes to exploit.

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1 Syntax

```
IMPR_RESU        (

◊ MODELE=MO    ,                                      [model]

   ♦FORMAT=/              "CASTEM",

   ◊   UNITE   =/unit      ,                          [I]
                 /37                                  [DEFAULT]
   ◊NIVE_GIBI=/3              ,
                 /10 ,                                [DEFAULT]


♦RESU   = (_F   (
   ♦    |        MAILLAGE=MA         ,     /          [mesh]
                                          /          [squelette]

        |   /CHAM_GD=CH_GD           ,
            /RESULTAT          =RESU  ,

        # Extraction of a field of variables of resu
              ◊/TOUT_CHAM=/              "OUI',    [DEFAULT]
                                 /"NON",
              /NOM_CHAM          =l_nomsymb ,  [l_K16]

                                 ◊/TOUT_ORDRE=' OUI',
[DEFAULT]
              /NUME_ORDRE        =lordre,    [l_I]
              /LIST_ORDRE        =lenti ,    [listis]
              /NUME_MODE         =lmode ,    [l_I]
              /NOEUD_CMP         =lnoecmp   , [l_K16]
              /NOM_CAS           =ncas ,    [l_K16]
              /ANGLE             =langl ,   [l_K16]
              //FREQ             =lfreq ,    [l_R]
                 /LIST_FREQ      =lreel ,    [listr8]
                 /INST           =linst ,    [l_R]
                 /LIST_INST      =lreel ,    [listr8]

                 ◊  | accuracy =  prec,       [R]
                             /1.0D-3, [DEFAULT]
                    | CRITERE  = "RELATIF",   [DEFAULT]
                             /"ABSOLU",

        # Selection of the components
                          ◊/TOUT_CMP=' OUI',
[DEFAULT]
           /NOM_CMP                =l_nomcmp ,     [l_K8]

              ),) ,
   )
```

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2 Formats of writing and logical unit

procedure `IMPR_RESU` makes it possible to write a mesh and/or values of results with the format of software CASTEM 2000 developed by the French atomic energy agency for a graphic visualization by GIBI. Software GIBI (operators of postprocessing of CASTEM 2000) is usable free with *Code_Aster*.

One asks for the creation of a file ASCII, which could be read again by GIBI. In GIBI, the relecture of the file is made by commands OPTI REST FORMS "*** .cast"; and REST FORMS; (them *** replace the name of the file of the cast `type` given by the user in astk).
`UNITE` is worth by default 37 and corresponds to the cast `type` in astk.

```
◊NIVE_GIBI=/3                          ,
                    /10  ,              [DEFAULT]
```

operand `NIVE_GIBI` makes it possible to choose level GIBI of printing of the mesh and/or the results. Level 10 (by default) corresponds to version GIBI-98, but the files thus generated can be read again by the more recent versions of GIBI. Version GIBI installed in the environment Aster is version GIBI-2000.

3 Key word `RESU`

This key word factor makes it possible to specify the results to print and the format according to which one wants to print them.
See [U4.91.01].

4 Printing of mesh: operands `MAILLAGE` / `MODELS`

This argument makes it possible to print the mesh with format "CASTEM". The printing of the mesh can be required only once and before very other result.

Concept of the model `type` is optional in the majority of the printings.
It is however compulsory, with format "CASTEM", during the printing of a field per element (it is transferred as an object CASTEM of mesh type).

With format "CASTEM", one prints:

- for each Aster *mesh group* an object CASTEM of mesh type and of the same name,
- a object CASTEM of mesh type containing all meshes mesh and accessible by the name from the Aster mesh ,
- and, if the MODEL `operand` were specified, an object CASTEM of mesh type containing all the meshes affected ones in the model *Aster* and accessible by the name from the model *Aster*.

Note:

If the mesh were generated with Ideas or GMSH, Ideas classification or GMSH is not retranscribed with format CASTEM. The classification nodes in CASTEM is identical to the numbers of the nodes in Aster.

1 Operands `CHAM_GD` and `RESULTAT`

the values of the computed fields are stored in data structures called fields of variables. These fields of variables can be directly accessible (concept `CHAM_GD`) where to be in a data structure gathering several fields of variables (result concept).

- a field of variables is a data structure which makes it possible to store fields defined in the nodes (`cham_no_*`) or fields defined by elements (`cham_elem_*`). For the fields by elements, one and the distinguishes the fields defined in the nodes from the elements fields defined in Gauss points

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of the elements (the latter are not displayable with GIBI). To visualize fields by elements with Gauss points, the user can however use MACR_ECLA_PG which makes it possible to build a new mesh meshes by bursting each mesh of the old mesh out of N smaller and a field at nodes with identical values in each top node of the mesh.

• a result concept is composed of one or more fields of variables. For example, with each computation step one stores in data structure result, the field of variables displacement. This structure is indexed by a matric structure of order 2, whose index is, for example, the list of times of computation and the other all the computed fields (displacements, stresses, strains,…).

One reaches in this case a field of variables by specifying a value of a variable of access (sequence number, time, frequency, number of mode…) and a field name ("DEPL", "SIGM_ELNO", …). There exist several types of result concept: evol_elas, evol_noli, mode_meca,.... A each one corresponds a list of fields and a list of licit variables of access.

Taking into account data structure result, one understands easily that the possibilities of printing which one lays out are those of the fields of variables, supplemented by specific possibilities.

Note:

With format "CASTEM" one can treat only the fields at nodes or the fields by element defined in the nodes (in this case one must obligatorily specify the name of a model Aster by the MODEL operand).

Operand CHAM_GD

a field at nodes *Aster* of name U is retranscribed with format "CASTEM" in a champoint of the same name. In CASTEM 2000, one can thus reach this field by the name U and one can carry out on this field all the operations allowed on champoints. It will be noted however that the components of the fields of variables DEPL which are in *Aster* DX, DY, DZ, DRX, DRY, DRZ will be in CASTEM UX, UY, UZ, X-ray, RY, RZ. For all the other components the name of the component in CASTEM will be defined by the first four characters of the name of the component in *Aster*. All the champoints are defined compared to the Aster mesh .

Some possible operations in GIBI on an object of the champoint type and named U :

• Creation and visualization of an object of the type deformed

```
DEF1 = DEFORMEMAILLAGEUAMPLICOULEUR                    ;
TRACDEF1              ;
```
• Creation of an object of type vector

```
VEC1 = VECTEURUUX        UY UZAMPLICOULEUR            ;
TRACVEC1MAILLAGE                  ;
```
• Creation of an object of the champoint type by extraction on a champoint

```
DEPX = EXCOUXU             ;
TRACDEPXMAILLAGE                  ;
```

A field by element with the nodes of name CHAM in *Aster* is written with format "CASTEM" in a chamelem of the same name. In CASTEM 2000, one can thus reach this field by the name cham and one can carry out on this field all the operations allowed on chamelem the nodes. It will be noted however that the components of the fields of variables SIGM which are in *Aster* SIXX, SIYY, SIZZ, SIXY, SIYZ, SIXZ will be in CASTEM SMXX, SMYY, SMZZ, SMXY, SMYZ, SMXZ. The components of quantity VARI will be named V1, V2,… For all the other components the name of the component in CASTEM will be obtained by concatenation of the two first and two last letters of the name of the component in *Aster*. All the chamelem with the nodes are defined compared to the model *Aster*.

Some possible operations in GIBI on an object of the cham_elem type and named CHAM :

All the processing on chamelem requires the preliminary creation of object CASTEM of a model type (nothing to see with the model Aster) what can be made by the command:

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```
MODCAST = MODEMODELEMECANIQUEELASTIQUE              ;
```

- • Creation of an object of the chamelem type by extraction on a chamelem

```
SIGXX = EXCOSMXXCHAM            ;
TRACOEILSIGXXMODCASTMAILLAGE                ;
```

- • Creation of an object of the chamelem type by operation on a chamelem

```
TRE1=   TRESCACHAMMODCAST         ; (forced of Tresca)
```

Operand RESULTAT

operand RESULTAT makes it possible to print the fields contained in a result concept . One can for example choose to print only certain fields (cf the following key word: NOM_CHAM).

With format "CASTEM", the result concept of name TITI is written in the form of an object CASTEM of the type counts (array) of the same name than the result concept *Aster*.

The first index of the array is an integer I which can take the value of the sequence numbers *Aster* (TITI. 1 is also an array).

The second array is subscripted by a character string made up of symbolic name *Aster* U = TITI. 1. DEPL (field of displacements at the sequence number 1), SIG = TITI. 2. SIGM_ELNO (stress field at the sequence number 2).

Example:

In *Aster* :
```
IMPR_RESU (RESU = (_F (RESULTAT = TITI,
        NUME_ORDRE = (1,2),
        NOM_CHAM= ("DEPL", "SIGM_ELNO")))
```

In CASTEM:
```
U   = TITI. 1. DEPL  ; (object CASTEM of the champoint type)
SIG = TITI. 2. SIGM_ELNO; (object CASTEM of the chamelem type)
```

1 Extraction of a field of variables

Operands TOUT_CHAM/NOM_CHAM

cf document [U4.71.00].

Operands TOUT_ORDRE/NUME_ORDRE/LIST_ORDRE/NUME_MODE/INST/LIST_INST/FREQ/LIST_FREQ/NOEUD_CMP/NOM_CAS/ANGLE/accuracy/CRITERE

cf document [U4.71.00].

2 Selection on the components

Another way reduce the volume of the printings is to print only the values of certain components (for example that displacement following the axis X : component DX).

One cannot print complex fields with format CASTEM, it is thus necessary, for such fields, to select the PARTIE Real or Imaginary to print.

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Operand `TOUT_CMP`

This key word makes it possible to indicate that one wishes to print all the components of the field. It is the value by default.

Operand `NOM_CMP`

This key word makes it possible to choose the list of the components `CHAM_GD` (`cham_no` and/or `cham_elem`) or of all the fields of the result concept which one wishes to print.

Key words `TOUT_CMP` and `NOM_CMP` cannot be used simultaneously.

These components are described in the specific documentation of the elements.

3 Notice

In Aster, it exists fields by elements with under points (as well for fields by elements with the nodes as for fields by elements with Gauss points).

Format "CASTEM", `IMPR_RESU` does not allow the printing of these fields by elements with under points.