

## Procedure IMPR\_RESU with the format 'MED'

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### 1 Goal

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To write the result of a calculation in a file with format MED. One describes the whole of the keywords of order IMPR\_RESU [U4.91.01] concerning this format of exit only.

One can write with the choice in a file with format MED:

- a grid,
- fields with the nodes,
- fields with the elements.

At the time of the writing of the fields by elements at the points of Gauss, one also writes the localization of the elements of reference (coordinated and weight of the points of Gauss).

MED (Modeling and Data exchanges) is a neutral format of data developed by EDF R & D and the ECA for the data exchanges between computer codes. The data which one can to exchange according to this format are the grids and the fields of results to the nodes and by elements. Files MED are binary and portable files (being pressed on the library HDF5, Hierarchical Dated Format). The writing of results in a file MED allows any other reading, computer code interfaced with MED the results produced by *Code\_Aster* via the order IMPR\_RESU.

## 2 Syntax

```
IMPR_RESU      (
# Syntax of procedure IMPR_RESU to format 'MED'
◇ UNIT = links,
◇ FORMAT = / 'MED', [DEFECT]

◇ PROC0 = / 'YES', [DEFECT]
          / 'NOT',
◇ INFORMATION = / 1, [DEFECT]
                / 2,

If format = 'MED':
{
  ◇ VERSION_MED = / '3.3.1', [DEFECT]
                  / '4.0.0',
}

/ LMBOU = _F (
  ◆ | GRID = my, [grid]
    | / RESULT = resu, [sd_resultat]

    ◇ / NOM_CHAM = l_nomsymb, [l_K16]

    ◇ / NUME_ORDRE = lordre, [l_I]
      / NUME_MODE = lmode, [l_I]
      / NOEUD_CMP = lnoecmp, [l_K16]
      / NOM_CAS = ncas, [l_K16]
      / ANGLE = langl, [l_K16]
      / / FREQ = lfreq, [l_R]
      / INST = linst, [l_R]
      ◇ | PRECISION = / prec, [R]
        / 1.0D-3, [DEFECT]
        | CRITERION = / 'RELATIVE', [DEFECT]
          / 'ABSOLUTE',

    / CHAM_GD = chgd, [cham_gd]

    ◇ / NOM_CHAM_MED = l_nomcham, [l_K64]
      / NOM_RESU_MED = l_nomresu, [K8]

    ◇ CARA_ELEM = carele, [cara_elem]

    ◇ PART = / 'REAL',
            / 'IMAG',
◇ IMPR_NOM_VARI = / 'YES', [DEFECT]
                 / 'NOT',
◇ INFO_MAILLAGE = / 'YES'
                  / 'NOT' [DEFECT]
),
)
```

## 3 Operands `FORMAT`, `UNIT`, `PROC0`, `VERSION_MED` and `INFORMATION`

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### 3.1 Operand `FORMAT`

The operand `FORMAT` allows to specify the format of the file where to write the result.

The format '`MED`' mean with the procedure `IMPR_RESU` that the result must be written in a file with format `MED`. It is the format of writing by default.

During the creation of a new file to the format `MED`, the impression is made with the format `MED` 3.3.1. If the file already exists, the level of format `MED` is preserved.

### 3.2 Operand `UNIT`

Defines in which unit one writes the file `med`. By default, `UNIT` = 80 and corresponds to the unit by default of the type `rmed` in `astk`.

### 3.3 Operand `PROC0`

The operand `PROC0` whose value by default is '`YES`', allows to restrict the impression on the processor of row 0. If one affects the value to him '`NOT`', the impressions will be carried out on all the processors.

### 3.4 Operand `INFORMATION`

The keyword `INFORMATION` when it is equal to 2 makes it possible to obtain information on the impressions carried out by the order.

### 3.5 Operand `VERSION_MED`

```
◇ VERSION_MED = /'3.3.1', [DEFECT]
                /'4.0.0',
```

During the creation of a new file to the format `med`, the impression is made with the format `med` 3.3.1. If the file already exists, the level of format `med` is preserved.

One can change the version of file `MED` with the keyword `VERSION_MED`.

## 4 Keyword factor `RESU`

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This keyword factor makes it possible to specify the results and fields to print.

### 4.1 Operand `GRID`

If the result is a grid (operand `grid` [U4.91.01]), the data deferred in the file result to format `MED` are:

- the list of the nodes                      number, name, coordinated,
- the list of the meshes                    number, name, type, name of the nodes,
- the list of the groups of nodes        number, name, many nodes, names of the nodes,
- the list of the groups of meshes       number, name, many meshes, names of the meshes.

**Foot-note:**

*In a file `MED`, there is partition of the nodes and the meshes according to the groups. A partition corresponds to a family `MED`. In a file `MED`, the groups are distributed within the families: families of nodes and families of elements are thus found there.*

## 4.2 Operand RESULT

The operand `RESULT` allows to print in a file `MED`, fields contained in a concept `result`.

One writes in the file 'MESSAGE' following information:

- operand 'RESULT',
- operand ' NAME\_CHAM',
- operand ' NUME\_ORDRE',
- name of the field stored in file `MED`: concatenation of the three preceding operands.

If `INFO_MAILLAGE = 'YES'`, more detailed information is printed in the file 'MESSAGE' at the time of the writing of the grid `MED`. One will be able for example to obtain the types of printed meshes, the names of the families `MED` which are created, etc.

## 4.3 Operand CARA\_ELEM

The operand `CARA_ELEM` is used for the impression of the fields for under-points. When `CARA_ELEM` is provided, the fields under-points are printed by adding information in file `MED` allowing to position the under-points by taking account of the contained information in `sd_cara_elem` (thickness of a hull, angle of gimlet of a multifibre beam,...).

Note:

*It is currently not possible to visualize fields at the under-points on elements PIPE in the module ParaViS of Salomé-Meca. One will be able for the moment to thus use operator IMPR\_RESU\_SP [U7.05.41] with this intention.*

## 4.4 Operand CHAM\_GD

The operand `CHAM_GD` allows to print in the file a structure of data of the type `cham_gd`. Concretely, one can thus print with this keyword a map, a field by elements or a field with the nodes.

## 4.5 Operand NOM\_CHAM\_MED

The operand `NOM_CHAM_MED` allows to define the name of field `MED`. It is a chain of 64 characters. This can be useful in particular when one wishes to print certain components of the field like several fields in same file `MED` (for example for the visualization of `SIRO_ELEM`).

## 4.6 Operand NOM\_RESU\_MED

The operand `NOM_RESU_MED` is an alternative to `NOM_CHAM_MED` concerning the terminology of fields `MED`. Its use will make it possible not to name fields `MED` explicitly more, which means that all the fields contained in the result will be printed. Each field name `MED` will be built to leave:

- character string provided to `NOM_RESU_MED` (chain of with more the 8 characters),
- reference symbol of the field Aster.

For example:

```
IMPR_RESU = (  
  FORMAT = 'MED',  
  RESU = _F ( RESULT = U,  
             NOM_RESU_MED = 'U_HAUT',  
             GROUP_MA = 'HIGH',  
             NUME_ORDRE = 1, )  
)
```

If the result `U` contains the fields `DEPL` and `SIEF_ELGA`, then the order above will produce fields `MED`:

- ' U\_HAUT\_\_DEPL',
- 'U\_HAUT\_\_SIEF\_ELGA' ,

This can be useful in particular when one wishes to print in same file MED the same field on different groups of meshes.

## 4.7 Operand IMPR\_NOM\_VARI

This keyword is useful in the case of the internal variables. When it is used and that impression of a field `VARI_*` was asked, it is in fact a field `VARI_*_NOMME` who will be printed. This field will have components whose name will be based on the catalogue of the laws of behavior used in calculation. If two laws of behavior have common internal variables, those will be amalgamated in a single component.

## 4.8 Operand PART

It is not possible to write complex fields. This is why it is necessary to choose between the real part (`PARTIE=' REEL'`) and the part complexes (`PARTIE=' IMAG'`).

## 4.9 Operands NOM\_CHAM / NUME\_ORDRE / NUME\_MODE / NOEUD\_CMP / NOM\_CAS / ANGLE / FREQ / INST / PRECISION / CRITERION / FILE

Cf document [U4.91.01].

## 5 Example

```
IMPR_RESU = (  
  FORMAT = 'MED',  
  RESU = _F ( RESULT = REMEZERO,  
             NOM_CHAM = 'ERME_ELEM',  
             NUME_ORDRE = 3,)  
)
```

Execution of the order IMPR\_RESU following posting in the file will cause 'MESSAGE' :

```
RESULT          : REMEZERO  
FIELD           : ERME_ELEM  
NUME_ORDRE      : 3  
==> NAME MED    : REMEZEROERME_ELEM
```

Example of use of NOM\_CHAM\_MED for the impression of SIRO\_ELEM :

```
IMPR_RESU (FORMAT=' MED',  
          RESU= (  
    _F (RESULTAT=RESUNL,  
        NOM_CHAM= ('SIRO_ELEM',),  
        NOM_CHAM_MED= ('RESUNL_SIRO_ELEM_NORMAL'),  
        NOM_CMP= ('SIG_NX', 'SIG_NY', 'SIG_NZ', 'SIG_N'),  
        GROUP_MA=' PRES',),  
    _F (RESULTAT=RESUNL,  
        NOM_CHAM= ('SIRO_ELEM',),  
        NOM_CHAM_MED= ('RESUNL_SIRO_ELEM_TANGENT'),  
        NOM_CMP= ('SIG_TX', 'SIG_TY', 'SIG_TZ'),  
        GROUP_MA=' PRES',),  
    _F (RESULTAT=RESUNL,  
        NOM_CHAM= ('SIRO_ELEM',),  
        NOM_CHAM_MED= ('RESUNL_SIRO_ELEM_T1'),  
        NOM_CMP= ('SIG_T1X', 'SIG_T1Y', 'SIG_T1Z',  
'SIG_T1'),),  
        GROUP_MA=' PRES',),  
    _F (RESULTAT=RESUNL,  
        NOM_CHAM= ('SIRO_ELEM',),  
        NOM_CHAM_MED= ('RESUNL_SIRO_ELEM_T2'),  
        NOM_CMP= ('SIG_T2X', 'SIG_T2Y', 'SIG_T2Z',  
'SIG_T2'),),  
        GROUP_MA=' PRES',),  
    ),),
```