

Utilities of management of the cards

Summary:

One presents the few routines here allowing to create cards easily. The cards are the constant fields by mesh.

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1 Introduction

The cards are fields [D4.06.05] "constant by element". Formally a map is a structure of data which puts in correspondence meshes and occurrences of the same size (for example `MATER` for the characteristics of material).

The cards are often used to store the data affected by the user on "zones" of its grid (orders `AFFE_CHAR_MECA`, `AFFE_MATERIAU`, `AFFE_CARA_ELEM`,...). These fields can then be used like "entries" of elementary calculations [D3.02.01].

Four routines are at the disposal of programmers to build `CARDS` :

- `MECACT` : to create a constant map.
- `ALCART` : "to allocate" a map.
- `NO CART` : to write a couple (size, zone_affectée) in a map.
- `TECART` : "to finish" a map (optional operation).

2 To create a constant MAP: routine `MECACT`

`CAL MECACT (base, map, mocle, nommoa, nomgd, ncmp, licmp,
ICMP, rcmp, ccmp, K8cmp)`

| | | | |
|---------------------|-------------------|---------------------------------------|--|
| <code>BASE</code> | <code>K1</code> | <code>IN</code> | name of the base of creation for the map ('G', 'V') |
| <code>MAP</code> | <code>K19</code> | <code>IN</code> <code>JXOUT</code> | name of the map to be created. |
| <code>MOCLE</code> | <code>K6</code> | <code>IN</code> | keyword giving access the concept grid: /One 'NETTED' affects all the meshes of <code>GRID</code> specified in <code>NOMMOA</code> (1:8) /'MODEL' one affects all the late meshes of the <code>LIGREL</code> specified in <code>NOMMOA</code> (1:19) |
| <code>NOMMOA</code> | <code>K*</code> | <code>IN</code> | name of the <code>GRID</code> or the <code>MODEL</code> or the <code>LIGREL</code> on which the map rests. |
| <code>NOMGD</code> | <code>I</code> | <code>IN</code> | name of the size associated with the map. |
| <code>NCMP</code> | <code>I</code> | <code>IN</code> | many <code>CMPS</code> of the affected size |
| <code>LICMP</code> | <code>L_K8</code> | <code>IN</code> | list of the names of the <code>CMP</code> of the affected size. |
| <code>ICMP</code> | <code>L_I</code> | <code>IN</code> | list of the values of the <code>CMPS</code> of the affected size if this one is of "whole" type |
| <code>RCMP</code> | <code>L_R</code> | <code>IN</code> | list of the values of the <code>CMPS</code> of the affected size if this one is of "real" type |
| <code>CCMP</code> | <code>L_R</code> | <code>IN</code> | list of the values of the <code>CMPS</code> of the affected size if this one is of type "complexes" |
| <code>K8CMP</code> | <code>L_K8</code> | <code>IN</code> | list of the values of the <code>CMPS</code> of the affected size if this one is of type "K8" |

Example:

```
licmp (1) = 'DX'  
licmp (2) = 'DY'  
rcmp (1) = 1.0  
rcmp (2) = 2.0
```

```
CAL MECACT ('ma_carte', 'netted', NETTED, 'depl_r', 2, licmp, IBID,  
rcmp, '')
```

will cause to create a constant map of the size 'DEPL_R' for which, all the meshes of the grid will be affected by the values:

(DX = 1.0, DY = 2.0).

3 To create a MAP by “zones”

3.1 Principle of creation by zones

A map is an ordered list of couples (size, zone_affectée). When for example, a user written in his command file:

```
AFFE_CHAR_MECA (...  
PRES_REP: (ALL: 'YES' NEAR: 0. )  
PRES_REP: (GROUP_MA: (GM1, GM3) NEAR: 2. )  
PRES_REP: (MESH: (M7, M8) NEAR: 7. )  
PRES_REP: (MESH: (M9) NEAR: 9. )
```

The map of size 'PRES_R' contains 5 zone_affectée and the sizes which are attached there.

It will be said that the map was created “by zone”. In the “large” made program:

| CAL ALCART | | | allowance of the map |
|------------|----------------|----------|--|
| CAL NOCART | ALL: 'YES' | NEAR: 0. | “writing” of the 1 ^{era} zone_affectée in the MAP |
| CAL NOCART | GROUP_MA: GM1 | NEAR: 2. | “writing” of the 2 ^{eme} zone_affectée in the MAP |
| CAL NOCART | GROUP_MA: GM3 | NEAR: 2. | “writing” of the 3 ^{eme} zone_affectée in the MAP |
| CAL NOCART | MESH: (M7, M8) | NEAR: 7. | “writing” of the 4 ^{eme} zone_affectée in the MAP |
| CAL NOCART | MESH: (M9) | NEAR: 7. | “writing” of the 5 ^{eme} zone_affectée in the MAP |

3.2 To allocate a MAP: routine ALCART

CAL ALCART (bases, map, netted, nomgd)

| | | | |
|--------|-----|-------------|---|
| BASE | K1 | IN | name of the base of creation for the map ('G', 'V') |
| MAP | K19 | IN JXOUT | name of the map to be created. |
| NETTED | K8 | IN JXIN | name of the grid on which the map is based. |
| NOMGD | K8 | IN | name of the size associated with the map. |

For the example of the §3.1 one will make:

```
CAL ALCART ('G', 'ma_carte', 'mailla_1', 'depl_r')
```

3.3 To write in a MAP: routine NOCART

```
CAL NOCART (map, code, group, mode, nma, limano, limanu, nomlig, ncmp)
```

| | | | |
|--------|------|-------------|--|
| MAP | K19 | IN JXVAR | name of the map where one wants "to write" |
| CODE | I | IN | code of zone_affectée: +1: the whole of the meshes of the grid (ALL: 'YES ') -1: the whole of the late meshes of one LIGREL +2: a GROUP_MA of the grid +3: a list of meshes of the grid -3: a list of late meshes of a LIGREL |
| GROUP | K8 | IN | used only if code = 2 it is the name of a group of meshes of the grid. |
| MODE | K3 | IN | used only if code = ± 3. mode = 'NUM' if one makes use of numbered meshes: LIMANU mode = 'NAME' if one makes use of named meshes: LIMANO |
| NMA | I | IN | used only if code = ± 3. it is the number of meshes in list LIMANU (or LIMANO) |
| LIMANO | L_K8 | IN | used only if code = + 3 it is the list of the names of the meshes of the grid which are affected by the size. |
| LIMANU | L_I | IN | used only if code = ± 3 it is the list of the numbers of the meshes which one affects. |
| NOMLIG | K19 | IN | used only if code = - 1 or = - 3. it is the name of the LIGREL where are defined the LATE meshes. |
| NCMP | I | IN | it is the number of CMP which one wants to note in the map. |

Information not transmitted by arguments.

The description of the size which one wants to note in the map makes via 2 objects of work which are allocated by ALCART :

```
MAP (1:19)/'.NCMP' V (K8)  
MAP (1:19)/'.VALV' V (?) (? = I, R, C, K8.)
```

- in MAP (1:19)/'.NCMP', the programmer writes the name of the components of the size which he wants to note.
- in MAP (1:19)/'.VALV', the programmer writes the values of the components (in the same order as .NCMP).

3.4 Treatment of the example

Treatment of the example of the §3.1

```
CAL ALCART ('G', MAP, netted, 'PRES_R')
CAL JEVEUO (MAP (1:19) //' .NCMP', 'E', IANCMP)
ZK8 (IANCMP) = 'PRES'
CAL JEVEUO (MAP (1:19) //' .VALV', 'E', IAAVALV)
ZR (IAAVALV) =0.
CAL NOCART (MAP, 1, '','', 0, '', IBID, '', 1)
ZR (IAAVALV) =2.
CAL NOCART (MAP, 2, 'GM1', '', 0, '', IBID, '', 1)
ZR (IAAVALV) =2.
CAL NOCART (MAP, 2, 'GM3', '', 0, '', IBID, '', 1)
ZR (IAAVALV) =7.
LIMANO (1) = 'M7'
LIMANO (2) = 'M8'
CAL NOCART (MAP, 3, '', 'NAME', 2, LIMANO, IBID, '', 1)
ZR (IAAVALV) =9.
LIMANO (1) = 'M9'
CAL NOCART (MAP, 3, '', 'NAME', 1, LIMANO, IBID, '', 1)
```

3.5 Principle of overload

The principle of overload is applied for one MAP : in the list of the affected zones, an element of the list overloads the elements which precedes it in the list. That wants to say that if a mesh belongs to several zone_affectée different, the size which is associated is that associated for him with the zone_affectée last which contains this mesh.

So in the preceding example, the mesh M8 belongs to the 2 GROUP_MA GM1 and GM3, the pressure which is associated for him is 7.

Notice important:

*The overload is total for all them CMPS size.
If one makes for example (map of 'DEPL_R') :*
GM1 → DX: 1. DY: 2.
GM3 → DX: 3. DZ: 4.

Meshs of GM3 are affected by the size: (DX: 3. DZ: 4.)

Meshs of GM1 (except those of GM3) are affected by the size: (DX: 1. DY: 2.)

One can want that the principle of overload is more "fine" and that meshs of the intersection of GM1 and GM3 "profit" from the 2 assignments and that their associated size is:

DX: 3. DY: 2. DZ: 4.

This is possible thanks to the routine TECART

3.6 “Fine” overload: routine TECART

CAL TECART (map)

| | | | |
|-----|-----|----------|------------------------------------|
| MAP | K19 | in/jxvar | name of the cartE with “to finish” |
|-----|-----|----------|------------------------------------|

This routine is to be called after the last call to NOCART.

This operation modifies the contents of the map to take account of the rule of overload “fine” defined in the preceding paragraph.

Practically, one “**extends**” the map on all the meshes, one determines on each one of them the size which is associated to him by a “fine” overload of the type:

```
M1: DX = 1.   DY = 2.0           ?   order of the calls
+ M1: DX = 3.0           DZ = 4.0 ?   with NOCART
-----
M1: DX = 3.0 DY = 2.0 DZ = 4.0
```

In the second time, one recompacte the map, by gathering the meshes which are affected by the same size.