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.

Contents

1 Introduction

The cards are fields [D4.06.05] “constant by element”. Formally a map is a structure of data which puts in correspondence meshs 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.
- NOCART : 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)
```

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.
MOCLE	K6	IN	keyword giving access the concept grid: /One ‘NETTED’ affects all the meshs of GRID specified in NOMMOA (1:8) /‘MODEL’ one affects all the late meshs of the LIGREL specified in NOMMOA (1:19)
NOMMOA	K*	IN	name of the GRID or the MODEL or the LIGREL on which the map rests.
NOMGD	I	IN	name of the size associated with the map.
NCMP	I	IN	many CMPS of the affected size
LICMP	L_K8	IN	list of the names of the CMP of the affected size.
ICMP	L_I	IN	list of the values of the CMPS of the affected size if this one is of “whole” type
RCMP	L_R	IN	list of the values of the CMPS of the affected size if this one is of “real” type
CCMP	L_R	IN	list of the values of the CMPS of the affected size if this one is of type “complexes”
K8CMP	L_K8	IN	list of the values of the CMPS 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 meshs 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 1era zone_affectée in the MAP
CAL NOCART	GROUP_MA: GM1	NEAR: 2.	"writing" of the 2ème zone_affectée in the MAP
CAL NOCART	GROUP_MA: GM3	NEAR: 2.	"writing" of the 3ème zone_affectée in the MAP
CAL NOCART	MESH: (M7, M8)	NEAR: 7.	"writing" of the 4ème zone_affectée in the MAP
CAL NOCART	MESH: (M9)	NEAR: 7.	"writing" of the 5ème 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 §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 meshs of the grid (ALL: 'YES ') -1: the whole of the late meshs of one LIGREL +2: a GROUP_MA of the grid +3: a list of meshs of the grid -3: a list of late meshs of a LIGREL
GROUP	K8	IN	used only if code = 2 it is the name of a group of meshs of the grid.
MODE	K3	IN	used only if code = ± 3. mode = 'NUM' if one makes use of numbered meshs: LIMANU mode = 'NAME' if one makes use of named meshs: LIMANO
NMA	I	IN	used only if code = ± 3. it is the number of meshs in list LIMANU (or LIMANO)
LIMANO	L_K8	IN	used only if code = + 3 it is the list of the names of the meshs 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 meshs 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 meshs.
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', IAVALV)
ZR (IAVALV) =0.
CAL NOCART (MAP, 1, '','', 0, '', IBID,'', 1)
ZR (IAVALV) =2.
CAL NOCART (MAP, 2, 'GM1', '', 0,'', IBID, '', 1)
ZR (IAVALV) =2.
CAL NOCART (MAP, 2, 'GM3', '', 0,'', IBID, '', 1)
ZR (IAVALV) =7.
LIMANO (1) = ' M7'
LIMANO (2) = ' M8'
CAL NOCART (MAP, 3, '', 'NAME', 2, LIMANO, IBID,'', 1)
ZR (IAVALV) =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 meshs, 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 meshs which are affected by the same size.