Structures of data Loads

Summary:

The structures of data “loads” are those produced by the orders AFFE_CHAR_XXXX. They are the structures of Data sd_char_meca, sd_char_ther and sd_char_acou

Contents

1 Structure of data sd_char_meca

A concept of the type sd_char_meca contains: one or more loadings and/or one or more boundary conditions affected on a mechanical model.

This concept is produced by one of the three operators: AFFE_CHAR_MECA, AFFE_CHAR_MECA_F or AFFE_CHAR_MECA_C.

A concept sd_char_meca is always associated with a grid, via the entities NODE, GROUP_NO, MESH, GROUP_MA on which the loadings are defined.

On this grid must have been affected a mechanical model.

A concept sd_char_meca can contain one sd_ligrel that one will call "ligrel of load" and sd_carte.

1.1 Tree structures of sd_char_meca

```
sd_char_meca (K8)    :: = record
   ◊    '.CHME'            :    sd_char_chme
   ◊    '.DUAL'            :    sd_char_dual

   ◊    '.TYPE'            :    S    E    K8
   ◊    '.LISMA01'         :    S    V    I
   ◊    '.LISMA02'         :    S    V    I
   ◊    '.TRANS01'         :    S    V    R
   ◊    '.TRANS02'         :    S    V    R
   ◊    '.POIDS_MAILLE'    :    S    V    R

sd_char_chme (K13)    :: = record
   ♦    '.MODEL.NOMO'  :    S  E  K8 long=1
   ◊    '.VEASS'       :    S  E  K8 long=1
   ◊    '.EVOL.CHAR'   :    S  E  K8 long=1
   ◊    '.VEISS'       :    S  E  K24 long=6

   ◊    '.LIGRE'    :    sd_ligrel
   ◊    '.CIMPO'    :    sd_carte
   ◊    '.CMULT'    :    sd_carte
   ◊    '.DPGEN'    :    sd_carte
   ◊    '.EPSIN'    :    sd_carte
   ◊    '. F1D2D'    :    sd_carte
   ◊    '. F1D3D'    :    sd_carte
   ◊    '. F2D3D'    :    sd_carte
   ◊    '.FCO2D'    :    sd_carte
   ◊    '.FCO3D'    :    sd_carte
   ◊    '.FELEC'    :    sd_carte
   ◊    '.FL101'    :    sd_carte
   ◊    '.FL102'    :    sd_carte
   ◊    '.FORNO'    :    sd_carte
   ◊    '.IMPE'     :    sd_carte
   ◊    '.PESAN'    :    sd_carte
   ◊    '.PRESS'    :    sd_carte
   ◊    '.ROTAT'    :    sd_carte
```

```
 ◊    '.SIGIN'    :    sd_carte
 ◊    '.SIINT'    :    sd_carte
 ◊    '.VNOR'     :    sd_carte
 ◊  ♦  '.ONDPL'   :    sd_carte
    ♦  '.ONDPR'   :    sd_carte


sd_char_dual (K13)    :: = record
   ♦    '.PRDK'  :    S  V  K8 lonmax >= nbpaq
   ♦    '.PRDI'  :    S  V  I  lonmax >= 3*nbpaq
   ♦    '.PRDSO':    S  V  K8 lonmax >= 4*nbpaq
```

1.2 Contents of the objects JEVEUX

'.CHME.MODEL.NOMO': name of the model associated with the load (K8)

'.CHME.TEMPE.TEMP': name of the field of temperature in the case of a thermal loading (K8)

'.CHME.VEASS': name of the assembled vector which one imposes the components like forces with the second member (K8)

'.CHME.VEISS': S.E. K24 (dim = 6)
The object contains 6 character strings K (6) defining the data necessary to the loading FORCE_SOL :
K (1) : number of unit of the temporal evolution of the contribution in rigidity of the impedance of ground.
K (2) : number of unit of the temporal evolution of the contribution in mass of the impedance of ground.
K (3) : number of unit of the temporal evolution of the contribution in damping of the impedance of ground.
K (4) : number of unit of the temporal evolution of the seismic forces imposed on the interface ground-structure.
K (5) : place of interface ground-structure defined by GROUP_NO_INTERF.
K (6) : place of interface ground-structure defined by SUPER_MAILLE.

'.TYPE': type of the load (K8)
It contains one of the 2 character strings :
'MECA_RE' --> reality for operator AFFE_CHAR_MECA
'MECA_FO' --> function for operator AFFE_CHAR_MECA_F

'.LISMA01': S V I (dim = 2* NBMAIL1)
NBMAIL1 = many meshs introduced behind the keywords ALL or MESH or in GROUP_MA keyword factor INTE_ELEC.
This object contains the list of the nodes of the linear elements defining the principal driver

'.LISMA02': S V I (dim = 2* NBMAIL2)
Even thing for the secondary driver (if there exists)

'.TRANS01': S V I (dim = 6)
/ case where the keyword TRANS of FORCE_ELEC is present:
tx, ty, tz, 0. , 0. , 0.
(tx, ty, tz) are the components of a translation of the principal driver with secondary driver

/ case where the keyword SYME of FORCE_ELEC is present:

x0, y0, z0, nx, ny, nz
(x0, y0, z0) : punctual coordinates
(nx, ny, nz) : components of the normal common to the principal driver and to secondary driver

1.2.1 sd_char_dual

This structure of data is used for the non-linear relations kinematics dualized (at the date of the 9/29/2015, that relates to only the relations due to the keyword LIAISON_SOLIDE).
The problem is to sufficient store information to be able to reactualize the relations during nonlinear calculation (if TYPE_CHARGE=' SUIV'). This structure of data is brought to evolve as the possibilities of non-linear relations are developed in the code.

One defines the concept of "package" of relations kinematics. A package corresponds to the list of the relations which one affects in a load at the time of a call to the routine aflrch. F90.
A package can be linear ('LIN') or not ('NLIN','3D3',...).

A package consists of nbrela relations.
A relation (when it is linearized) consists of nbterm (on the left of the sign " = ") and of a second member.
nbterm coefficients of the relation are stored in the map.CHME.CMULT.
The second member is stored in the map.CHME.CIMPO.

It is important to know that each term of a dualized kinematic relation is associated with a finite element of "Late" Dirichlet associated with a mesh of the type SEG3 "late" stored in the object .NEMA ligrel '.CHME.LIGRE'. The classification of these late meshs is "natural": the relations of a package are stored end to end and the terms of a relation are stored the ones after the others. It is what explains the contents of the object .PRDI : one stores information there allowing to shift package out of package.

Object.PRDK :

This object is length >= nbpaqu if nbpaqu is the number of "packages" of relations contained in the load. The attribute LONUTI of this object is equal to nbpaqu.

For k=1, nbpaqu:
.PRDK (K) = code
With code =

'FLAX'	The relations are always linear
'NLIN'	The relations are a priori nonlinear (but one does not know any more). If these relations are then used with TYPE_CHARGE=' SUIV', the code must stop in error.
'3D3'	The relations correspond to an occurrence of the keyword factor LIAISON_SOLIDE. The "solidified" nodes are in a space of dimension 3 and they form a "voluminal" group of dots (6 movements of solid body). Notice important: The solidified nodes carry ddls of translation (DX, DY and DZ) but they do not carry a ddls of rotation (DRX, DRY MARTINI and DRZ).
'3D2'	Idem '3D3'except that the cloud of the points is "plan" (6 movements of solid body)
'3D1'	Idem '3D3'except that the cloud of the points is "right" (5 movements of solid body)
'2D2'	The relations correspond to an occurrence of the keyword factor LIAISON_SOLIDE. The "solidified" nodes are in a space of dimension 2 and they form a "surface" group of dots (3 movements of solid body). Notice important: The solidified nodes carry ddls of translation (DX and DY) but not of ddl of rotation (DRZ).

'2D1'	Idem '2D2'except that the cloud of the points is "right" (3 movements of solid body)
'ROTA3D'	The relations correspond to an occurrence of the keyword factor LIAISON_SOLIDE. The "solidified" nodes are in a space of dimension 3. There exists at least a solidified node not carrying the 3 ddls of rotation (DRX, DRY MARTINI and DRZ).
'ROTA2D'	The relations correspond to an occurrence of the keyword factor LIAISON_SOLIDE. The "solidified" nodes are in a space of dimension 2. There exists at least a solidified node not carrying the ddl of rotation DRZ.

Object. PRDI :

This object is length >= 3* nbpaqu

```
.PRDI (3* (k-1) +1): nbrela
.PRDI (3* (k-1) +2): nbterm
.PRDI (3* (k-1) +3): term1
```

nbrela is the number of relations of the package K.
nbterm is the full number of terms of the package K.
term1 is the number of the late mesh associated with the 1st term of the 1st relation of the package K.

Object. PRDSO :

This object is length >= 4* nbpaqu
It is dedicated to the keyword LIAISON_SOLIDE.

```
.PRDSO (4* (k-1) +1): no1
.PRDSO (4* (k-1) +2): no2
.PRDSO (4* (k-1) +3): NO3
.PRDSO (4* (k-1) +4): no4
```

no1, no2, NO3 and no4 are the names of 4 nodes (with more) which make it possible to define the solid body.
4 nodes are necessary for example for the case '3D3', but for the case'2D1', only 2 nodes are stored.

1.3 Description of the cards of one CHAR_MECA

Name map	Name size	Description
.CIMPO	DDLI_R, _C, _F	second member of the equations of boundary conditions kinematics
.CMULT	DDLM_R, _C	coefficients of the equations of boundary conditions kinematics
.DPGEN	NEUT_R	generalized efforts
.EPSIN	EPSI_R, _F	initial deformation PRE_EPSI
. F1D1D	FORC_R, _C, _F	linear force divided into 1D
. F1D2D	FORC_R, _C, _F	linear force divided into 2D
. F1D3D	FORC_R, _C, _F	linear force divided into 3D
. F2D3D	FORC_R, _C, _F	surface force divided into 3D
.FCO2D	FORC_R, _C, _F	force distributed for hulls “2D”
.FCO3D	FORC_R, _C, _F	force distributed for hulls “3D”
.FELEC	FELECR	positional parameters of the drivers
.FL101	LISTMA	forces of Laplace
.FL102	LISTMA	forces of Laplace
.FLUX	FTHM_R, _F	flow “THM”
.FORNO	FORC_R, _F	nodal forces
.IMPE	IMPE_R, _F	impedance (acoustic)
.ONDE	ONDE_R, _F	amplitude of pressure of incidental wave (acoustic)
.PESAN	PESA_R	comes from GRAVITY
.PRESS	PRES_R, PRES_F	pressure distributed
.SIGIN	SIEF_R	comes from RELA_CINE_BP
.SIINT	SIEF_R	Initial constraint PRE_SIGM
.ROTAT	ROTA_R	comes from ROTATION
.VNOR	SOUR_R, SOUR_F	normal speed of a mesh (acoustic)
.ONDPL	NEUT_K24	comes from ONDE_PLANE
.ONDPR	NEUT_R	comes from ONDE_PLANE

1.4 Example

```
CH  = AFFE_CHAR_MECA (model      : Mo
                      DDL_IMPO    : (GROUP_NO: (WITH B)  Dy  : 0.  )
                      FACE_IMPO   : (MESH   : M266   dnor: 0.  )
                      PRES_REP    : (GROUP_MA: GRMA13  near: 60.));
```

product:

```
====> IMPR_CO OF THE STRUCTURE OF DATA: CH      ??????????????
ATTRIBUTE: F CONTAINED: T BASES: >G<
MANY OBJECTS (OR COLLECTIONS) FIND: 27
================================================================================
```

```
  IMPRESSION OF THE CONTENTS OF THE LOST PROPERTY:
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CIMPO.DESC        <
      1 -           24            6            6           -3            1
      6 -           -3            2           -3            3           -3
     11 -            4           -3            5           -3            6
     16 -            2            2            2            2            2
     21 -            2
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CH      .CHME.CIMPO.LIMA
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CIMPO.LIMA<  OC:      1
      1 -           -1
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CIMPO.LIMA<  OC:      2
      1 -           -2
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CIMPO.LIMA<  OC:      3
      1 -           -3
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CIMPO.LIMA<  OC:      4
      1 -           -4
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CIMPO.LIMA<  OC:      5
      1 -           -5
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CIMPO.LIMA<  OC:      6
      1 -           -6
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CIMPO.NOLI        <
      1 - >CH      .CHME.LIGRE.LIEL<>CH      .CHME.LIGRE.LIEL<
      3 - >CH      .CHME.LIGRE.LIEL<>CH      .CHME.LIGRE.LIEL<
      5 - >CH      .CHME.LIGRE.LIEL<>CH      .CHME.LIGRE.LIEL<
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CIMPO.NOMA        <
      1 - >M       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CIMPO.VALE        <
      1 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
      6 -  0.00000E+00
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CMULT.DESC        <
      1 -           26            6            6           -3            1
      6 -           -3            2           -3            3           -3
     11 -            4           -3            5           -3            6
     16 -            2            2            2            2            2
     21 -            2
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CH      .CHME.CMULT.LIMA
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CMULT.LIMA<  OC:      1
      1 -           -1
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CMULT.LIMA<  OC:      2
      1 -           -2
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CMULT.LIMA<  OC:      3
      1 -           -3
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CMULT.LIMA<  OC:      4
      1 -           -4
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CMULT.LIMA<  OC:      5
      1 -           -5
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.CMULT.LIMA<  OC:      6
      1 -           -6
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CMULT.NOLI        <
      1 - >CH      .CHME.LIGRE.LIEL<>CH      .CHME.LIGRE.LIEL<
      3 - >CH      .CHME.LIGRE.LIEL<>CH      .CHME.LIGRE.LIEL<
      5 - >CH      .CHME.LIGRE.LIEL<>CH      .CHME.LIGRE.LIEL<
```

```
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CMULT.NOMA        <
      1 - >M       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.CMULT.VALE        <
      1 -  1.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
      6 -  0.00000E+00  1.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
     11 -  0.00000E+00  0.00000E+00 -7.07107E-01  0.00000E+00  0.00000E+00
     16 -  0.00000E+00  0.00000E+00  0.00000E+00  7.07107E-01  0.00000E+00
     21 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00 -7.07107E-01
     26 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
     31 -  7.07107E-01  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
     36 -  0.00000E+00
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.DPGEN.DESC        <
      1 -           58            1            1            1         9999
      6 -         8190
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CH      .CHME.DPGEN.LIMA
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.DPGEN.LIMA<  OC:      1
      1 -            0
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.DPGEN.NOLI        <
      1 - >                        <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.DPGEN.NOMA        <
      1 - >M       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.DPGEN.VALE        <
      1 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
      6 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  1.00000E+00
     11 -  1.00000E+00  1.00000E+00
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CH      .CHME.LIGRE.LIEL
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.LIEL<  OC:      1
      1 -           -1           -2           -4           -6           39
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.LIEL<  OC:      2
      1 -           -3           -5           38
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.LIGRE.NBNO        <
      1 -            8
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CH      .CHME.LIGRE.NEMA
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.NEMA<  OC:      1
      1 -            1           -1           -2            4
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.NEMA<  OC:      2
      1 -          119           -3           -4            4
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.NEMA<  OC:      3
      1 -           57           -5           -6            4
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.NEMA<  OC:      4
      1 -           57           -5           -6            4
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.NEMA<  OC:      5
      1 -           41           -7           -8            4
```

```
OBJECT IMPRESSION OF COLLECTION >CH      .CHME.LIGRE.NEMA<  OC:      6
     1 -           41           -7           -8            4
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.LIGRE.NOMA        <
     1 - >M       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.LIGRE.PRNS        <
     1 -         4096         4096         4096         4096         4096
     6 -         4096         4096         4096
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.MODEL.NOMO        <
     1 - >MO      <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.PRESS.DESC        <
     1 -           63            2            2            1         9999
     6 -            2            3            6            6
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CH      .CHME.PRESS.LIMA
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.PRESS.LIMA<  OC:      1
     1 -            0
 OBJECT IMPRESSION OF COLLECTION >CH      .CHME.PRESS.LIMA<  OC:      2
     1 -            0
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.PRESS.NOLI        <
     1 - >                        <>                       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.PRESS.NOMA        <
     1 - >M       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .CHME.PRESS.VALE        <
     1 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
     6 -  0.00000E+00  6.00000E+01  0.00000E+00  0.00000E+00  0.00000E+00
    11 -  0.00000E+00  0.00000E+00
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CH      .TYPE                   <
     1 - >MECA_RE <
 ====> FINE IMPR_CO OF STRUCTURE OF DATA: CH      ????????????????
```

2 Structure of data sd_char_ther

A concept of the type sd_char_ther contains one or more loadings and/or one or more boundary conditions affected on a thermal model.

This concept is produced by one of the two operators: AFFE_CHAR_THER or AFFE_CHAR_THER_F.

A concept char_ther is always associated with a grid, via the entities NODE, GROUP_NO, MESH, GROUP_MA on which the loadings are defined.

On this grid must have been affected a thermal model.

A concept sd_char_ther can contain one sd_ligrel, known as "ligrel of load".

2.1 Tree structure of the SD char_ther

```
sd_char_ther   (K8)  ::   =   record
  ◊   '.CHTH.MODEL.NOMO'    :   S  E  K8
  ◊   '.CHTH.CONVE.VALE'    :   S  V  K8
  ◊   '.TYPE'               :   S  E  K8

  ◊   '.CHTH.LIGRE'       :   sd_ligrel
  ◊   '.CHTH.CIMPO'       :   sd_carte
  ◊   '.CHTH.CMULT'       :   sd_carte
  ◊   '.CHTH.COEFH'       :   sd_carte
  ◊   '.CHTH.FLUNL'       :   sd_carte
  ◊   '.CHTH.FLURE'       :   sd_carte
  ◊   '.CHTH.GRAIN'       :   sd_carte
  ◊   '.CHTH.HECHP'       :   sd_carte
  ◊   '.CHTH.SOURE'       :   sd_carte
  ◊   '.CHTH.T_EXT'       :   sd_carte
```

2.2 Contents of the objects JEVEUX

'.CHTH.MODEL.NOMO' : name of the model associated with the load (K8)

'.CHTH.CONVE.VALE' : vector of dimension 1 container the name of the field speed of transport in the case of the equation of diffusion-convection

'.TYPE' : type of the load (K8)
It contains one of the 2 character strings:
'THER_RE' --> real for operator AFFE_CHAR_THER
'THER_FO' --> function for operator AFFE_CHAR_THER_F

2.3 Example

```
CHTH =AFFE_CHAR_THER  (MODEL: MOTH
        FLUX_REP: (GROUP_MA: GRMA13 FLUN: 0.0)
                  (GROUP_MA: GRMA14 FLUN: 1729.9091)
        EXCHANGE:  (GROUP_MA: GRMA12 COEF_H: 500. TEMP_EXT: 17.034444)
        TEMP_IMPO: (GROUP_NO: GRNM15 TEMP: 100.0)
                   );
```

product:

```
 ====> IMPR_CO OF THE STRUCTURE OF DATA: CHTH    ??????????????
 ATTRIBUTE: F CONTAINED: T BASES: >G<
 MANY OBJECTS (OR COLLECTIONS) FIND: 32
================================================================================
  IMPRESSION OF THE CONTENTS OF THE LOST PROPERTY:
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CIMPO.DESC        <
      1 -           24            2            2           -3            1
      6 -           -3            2            2            2
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.CIMPO.LIMA
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.CIMPO.LIMA<  OC:      1
      1 -           -1
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.CIMPO.LIMA<  OC:      2
      1 -           -2
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CIMPO.NOLI        <
      1 - >CHTH    .CHTH.LIGRE.LIEL<>CHTH    .CHTH.LIGRE.LIEL<
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CIMPO.NOMA        <
      1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CIMPO.VALE        <
      1 -  1.00000E+02  1.00000E+02
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CMULT.DESC        <
      1 -           26            2            2           -3            1
      6 -           -3            2            2            2
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.CMULT.LIMA
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.CMULT.LIMA<  OC:      1
      1 -           -1
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.CMULT.LIMA<  OC:      2
      1 -           -2
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CMULT.NOLI        <
      1 - >CHTH    .CHTH.LIGRE.LIEL<>CHTH    .CHTH.LIGRE.LIEL<
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CMULT.NOMA        <
      1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.CMULT.VALE        <
      1 -  1.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
      6 -  0.00000E+00  1.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00
     11 -  0.00000E+00  0.00000E+00
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.COEFH.DESC        <
      1 -           18            2            2            3            1
      6 -            3            2           14           14
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.COEFH.LIMA

 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.COEFH.LIMA<  OC:      1
      1 -            1            2            3            4            5
      6 -            6            7            8            9           10
     11 -           11           12           13           14           15
     16 -           16           17           18           19           20
```

```
     21 -           21           22           23           24           25
     26 -           26           27           28           29           30
     31 -           31           32           33           34           35
     36 -           36           37           38           39           40
     41 -           41           42           43           44           45
     46 -           46           47           48           49           50
     51 -           51           52           53           54           55
     56 -           56           57           58           59           60
     61 -           61           62           63           64           65
     66 -           66           67           68           69           70
     71 -           71           72           73           74           75
     76 -           76           77           78           79           80
     81 -           81           83           84           85           86
     86 -           87           88           89           90           91
     91 -           92           93           94           95           96
     96 -           97           98           99          100          101
    101 -          102          104
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.COEFH.LIMA<  OC:      2
      1 -           82          103
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.COEFH.NOLI        <
      1 - >                        <>                       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.COEFH.NOMA        <
      1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.COEFH.VALE        <

      1 -  0.00000E+00  0.00000E+00  0.00000E+00  5.00000E+02  0.00000E+00
      6 -  0.00000E+00
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.FLURE.DESC        <

      1 -           37            2            2            3            1
      6 -            3            2           14           14
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.FLURE.LIMA
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.FLURE.LIMA<  OC:      1
      1 -            1            2            3            4            5
      6 -            6            7            8            9           10
     11 -           11           12           13           14           15
     16 -           16           17           18           19           20
     21 -           21           22           23           24           25
     26 -           26           27           28           29           30
     31 -           31           32           33           34           35
     36 -           36           37           38           39           40
     41 -           41           42           43           44           45
     46 -           46           47           48           49           50
     51 -           51           52           53           54           55
     56 -           56           57           58           59           60
     61 -           61           62           63           64           65
     66 -           66           67           68           69           70
     71 -           71           72           73           74           75
     76 -           76           77           78           79           80
     81 -           81           82           84           85           86
     86 -           87           88           89           90           91
     91 -           92           93           94           95           96
     96 -           97           98           99          100          101
    101 -          102          103          104
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.FLURE.LIMA<  OC:      2
```

```
     1 -           83
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.FLURE.NOLI        <
     1 - >                        <>                        <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.FLURE.NOMA        <
     1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.FLURE.VALE        <
     1 -  0.00000E+00  0.00000E+00  0.00000E+00  1.72991E+03  0.00000E+00
     6 -  0.00000E+00
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.LIGRE.LIEL
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.LIGRE.LIEL<  OC:      1
     1 -           -1           -2           45
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.LIGRE.NBNO        <
     1 -            4
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.LIGRE.NEMA
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.LIGRE.NEMA<  OC:      1
     1 -            1           -1           -2            4
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.LIGRE.NEMA<  OC:      2
     1 -            2           -3           -4            4
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.LIGRE.NOMA        <
     1 - >MAIL    <
--------------------------------------------------------------------------------

 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.LIGRE.PRNS        <
     1 -           16           16           16           16
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.MODEL.NOMO        <
     1 - >MOTH    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.T_EXT.DESC        <
     1 -           74            2            2            3            1
     6 -            3            2           14           14
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHTH    .CHTH.T_EXT.LIMA
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.T_EXT.LIMA<  OC:      1
     1 -            1            2            3            4            5
     6 -            6            7            8            9           10
    11 -           11           12           13           14           15
    16 -           16           17           18           19           20
    21 -           21           22           23           24           25
    26 -           26           27           28           29           30
    31 -           31           32           33           34           35
    36 -           36           37           38           39           40
    41 -           41           42           43           44           45
    46 -           46           47           48           49           50
    51 -           51           52           53           54           55
    56 -           56           57           58           59           60
    61 -           61           62           63           64           65
    66 -           66           67           68           69           70
    71 -           71           72           73           74           75
    76 -           76           77           78           79           80
    81 -           81           83           84           85           86
    86 -           87           88           89           90           91
    91 -           92           93           94           95           96
```

```
     96 -           97           98           99          100          101
    101 -          102          104
 OBJECT IMPRESSION OF COLLECTION >CHTH    .CHTH.T_EXT.LIMA<  OC:      2
      1 -           82          103
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.T_EXT.NOLI        <
      1 - >                         <>                        <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.T_EXT.NOMA        <
      1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .CHTH.T_EXT.VALE        <
      1 -  0.00000E+00  0.00000E+00  0.00000E+00  0.00000E+00  1.70344E+01
      6 -  0.00000E+00  0.00000E+00  0.00000E+00
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHTH    .TYPE                   <
      1 - >THER_RE <
 ====> FINE IMPR_CO OF STRUCTURE OF DATA: CHTH    ??????????????
```

3 Structure of data sd_char_acou

A concept of the type sd_char_acou contains one or more loadings affected on an acoustic model.

This concept is produced by the operator: AFFE_CHAR_ACOU.

A concept sd_char_acou is always associated with a grid, via the entities NODE, GROUP_NO, MESH, GROUP_MA on which the loadings are defined.

On this grid must have been affected an acoustic model.

A concept sd_char_acou can contain one ligrel, known as "ligrel of load".

3.1 Tree structure of the SD CHAR_ACOU

```
 sd_char_acou (K8):: = record

   (F) '.CHAC.MODEL.NOMO'    :  S  E K8
   (F) '.TYPE'               :  S  E K8

   (F) '.CHAC.LIGRE'         :  sd_ligrel
   (F) '.CHAC.CIMPO'         :  sd_carte
   (F) '.CHAC.CMULT'         :  sd_carte
   (F) '.CHAC.IMPED'         :  sd_carte
   (F) '.CHAC.VITFA'         :  sd_carte
```

3.2 Contents of the objects JEVEUX

'.CHAC.MODEL.NOMO' : name of the acoustic model associated with the load (K8)

'.TYPE' : type of the load (K8)
The chain contains 'ACOU_RE' (assignment of reality)

3.3 Example

```
   CHARACOU = AFFE_CHAR_ACOU (MODEL    : GUIDE
                VITE_FACE: (GROUP_MA: ENTRY VNOR: IH 0,014  0.)
                IMPE_FACE: (GROUP_MA: EXIT IMPE: IH 445.9  0.));
```

product:

```
 ====> IMPR_CO OF THE STRUCTURE OF DATA: CHARACOU???????????????
 ATTRIBUTE: F CONTAINED: T BASES: >G<
 MANY OBJECTS (OR COLLECTIONS) FIND: 12
================================================================================
  IMPRESSION OF THE CONTENTS OF THE LOST PROPERTY:
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.IMPED.DESC        <
      1 -           46            2            2            3            1
      6 -            3            2            2            2
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHARACOU.CHAC.IMPED.LIMA
 OBJECT IMPRESSION OF COLLECTION >CHARACOU.CHAC.IMPED.LIMA<  OC:      1
      1 -            1            2            3            4            9
```

```
      6 -           10           11           12           13           14
     11 -           15           16           17           18           19
     16 -           20           21           22           23           24
     21 -           25           26           27           28           29
     26 -           30           31           32           33           34
     31 -           35           36           37           38           39
     36 -           40           41           42           43           44
     41 -           45           46           47           48           49
     46 -           50           51           52           53           54
     51 -           55           56           57           58           59
     56 -           60           61           62           63           64
     61 -           65           66           67           68
 OBJECT IMPRESSION OF COLLECTION >CHARACOU.CHAC.IMPED.LIMA<  OC:      2
      1 -            5            6            7            8
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.IMPED.NOLI        <
      1 - >                       <>                       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.IMPED.NOMA        <
      1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.IMPED.VALE        <
      1 - (0.00000E+00, 0.00000E+00) (4.45900E+02, 0.00000E+00)
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.MODEL.NOMO        <
      1 - >GUIDE   <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.VITFA.DESC        <
      1 -           76            2            2            3            1
      6 -            3            2            2            2
--------------------------------------------------------------------------------
 IMPRESSION OF THE COLLECTION: CHARACOU.CHAC.VITFA.LIMA
 OBJECT IMPRESSION OF COLLECTION >CHARACOU.CHAC.VITFA.LIMA<  OC:      1
      1 -            1            2            3            4
 OBJECT IMPRESSION OF COLLECTION >CHARACOU.CHAC.VITFA.LIMA<  OC:      2
      1 -            5            6            7            8            9
      6 -           10           11           12           13           14
     11 -           15           16           17           18           19
     16 -           20           21           22           23           24
     21 -           25           26           27           28           29
     26 -           30           31           32           33           34
     31 -           35           36           37           38           39
     36 -           40           41           42           43           44
     41 -           45           46           47           48           49
     46 -           50           51           52           53           54
     51 -           55           56           57           58           59
     56 -           60           61           62           63           64
     61 -           65           66           67           68
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.VITFA.NOLI        <
      1 - >                       <>                       <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.VITFA.NOMA        <
      1 - >MAIL    <
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.CHAC.VITFA.VALE        <
      1 - (1.40000E-02, 0.00000E+00) (0.00000E+00, 0.00000E+00)
--------------------------------------------------------------------------------
 SEGMENT IMPRESSION OF VALUES >CHARACOU.TYPE                   <
      1 - >ACOU_RE <
```