

## Structure of data sd\_liste\_rela

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### Summary:

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## 1 General information

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The structure of data `sd_liste_rela` is a “volatile” structure of data which is useful in the operators `AFFE_CHAR_XXXX` of intermediate structure between the data of the user (linear relations with dualiser) and their translation in finite elements of Lagrange (in `LIGREL` of `LOAD`) and in `CARDS` containing the coefficients of the relations.

Approximately, the idea is the following one: one progressively stores the linear relations (one by one) in one `sd_liste_rela` (routine `AFRELA`) then one “pours” `sd_liste_rela` in `sd_char_xxx` at the end of the order (routine `AFLRCH`).

**Notice :**

*one can create several `sd_liste_rela` within the same order `AFFE_CHAR_XXX`. It is then necessary “to pour” each one of these SD in `sd_char_xxx`. That makes it possible to make independent the various routines which manage linear relations: `caddli`, `cafaci`,...*

## 2 Tree structure

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```
sd_liste_rela (K19)  :: =record
  (O) \.RLCO' : OJB  S  V  R/C
  (O) \.RLBE' : OJB  S  V  R/C/K24
  (O) \.RLDD' : OJB  S  V  K8
  (O) \.RLNO' : OJB  S  V  K8
  (O) \.RLNT' : OJB  S  V  I
  (O) \.RLPO' : OJB  S  V  I
  (O) \.RLSU' : OJB  S  V  I
  (O) \.RLTC' : OJB  S  E  K8
  (O) \.RLTV' : OJB  S  E  K8
  (O) \.RLNR' : OJB  S  E  I
```

## 3 Contents of the objects

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**Notations:**

- `nb_rela` : many relations stored in `sd_liste_rela`.
- `nb_coef_lrel` : many coefficients of a linear relation (“left” part of the equation). The coefficients can be: realities or complexes.
- `nb_coef_tot` : full number of coefficients of the whole of the linear relations stored in `sd_liste_rela`.  
$$\text{nb\_coef\_tot} = \text{nb\_coef\_lrel} (1) + \text{nb\_coef\_lrel} (2) + \dots$$
- `coef_impo` : specified value for the linear relation (“right” part of the equation or “second member”). The specified value can be: real, complex or function.

### 3.1 Object “`.RLNR`”

This object is length 1.

`RLNR (1)` : many linear relations `nb_rela`.

## 3.2 Object ".RLTC"

This object is length 1.

RLTC (1) : type of the coefficients of the relations 'REAL' or 'COMP'.

## 3.3 Object ".RLTV"

This object is length 1.

RLTV (1) : type of the second members of the relations 'REAL', 'COMP' or 'FONC'.

## 3.4 Object ".RLNT"

This object is length nb\_rela.

It contains the numbers of coefficients for each relation.

RLNT (irela) : many coefficients of the relation irela = nb\_coef\_1rel (irela).

## 3.5 Object ".RLPO"

This object is length nb\_rela.

It makes it possible "to point" (for a given relation) in the objects.RLCO.RLNO and.RLDD.

These 3 objects have same dimension and one points there in the same way.

RLPO (irela) : address in .RLCO (for example) of the last coefficient of the relation irela.

RLCO (RLPO (irela) - RLNT (irela) + 1) is the 1<sup>er</sup> term of the relation irela.

## 3.6 Object ".RLCO"

This object is length nb\_coef\_tot.

It contains the coefficients (R or C) equations.

## 3.7 Object ".RLNO"

This object is length nb\_coef\_tot.

It contains the names of the nodes implied in the relations.

## 3.8 Object ".RLDD"

This object is length nb\_coef\_tot.

It contains the names of CMPS implied in the relations.

## 3.9 Object ".RLBE"

This object is length nb\_rela.

It contains the second members of the relations.

RLBE (irela) : second member of the relation irela = coef\_impo (irela).

## 3.10 Object ".RLSU"

This object is length nb\_rela. It is an indicator to say if the linear relations must be taken into account (or not).

Indeed, before "pouring" the linear relations in the sd\_charge, one examines whether certain relations are not given in several specimens (doubled blooms).

RLSU (irela) :  
/ 0 - > the relation irela is to be taken into account.  
/ 1 - > the relation irela is the doubled bloom of a preceding relation.  
It should not be taken into account