

Operator NUME_DDL

1 Drank

Order the linear unknowns of a system of equations. This operator “also prepares” the assembly of the matrix associated with this system of equations.

It is in this operator that the method of resolution of the linear systems is selected: LDLT, conjugate gradient, multi-frontal...

Product a data structure of the `nume_ddl` type.

2 Syntax

```
nu [nume_ddl] = NUME_DDL (
    ◆/MODELE=mo , [model]
      ◇CHARGE=lchar , / [l_char_meca]
                          / [l_char_ther]
                          / [l_char_acou]

    /MATR_RIGI =lme1 , / [l_matr_elem_TEMP_R]
                          / [l_matr_elem_DEPL_R]
                          / [l_matr_elem_DEPL_C]
                          / [l_matr_elem_PRES_C]

    /METHODE = ' MULT_FRONT', [DEFAULT]
      " MONGREL" ◇RENUM=/, [DEFAULT]
      / "MD",
      / "MDA",

    /METHODE = ' LDLT',
      ◇RENUM=/ "RCMK", [DEFAULT]
      / "SANS",

    /METHODE = ' MUMPS',
      ◇RENUM=/ "AUTO", [DEFAULT]
      / "AMD",
      / "AMF",
      / "MONGREL",
      / "PORD",
      / "QAMD",

    /METHODE = ' PETSC',

    /METHODE = ' GCPC',
      ◇RENUM=/ "RCMK", [DEFAULT]
      / "SANS",

    ◇INFO=/1 , [DEFAULT]
      /2 ,
    )
```

3 General information

This command makes it possible to number the equations (and the unknown) linear systems to solve. One also prepares the work of assembly of the matrixes, by drawing up the tables of pointers corresponding to the storage chosen for these matrixes.

The choice of the method of resolution of the linear systems is made by key word `METHODE` (method "MULT_FRONT" by default).

4 Operands

4.1 Operand `MODELS/CHARGE`

◆/ `MODELS = Mo` , `CHARGE = lchar`

the code will number the degrees of freedom of the elements of the model `Mo` as well as the degrees of freedom of dualisation of the kinematical conditions dualized possibly present in the loads of the list `lchar`.

4.2 Operand `MATR_RIGI`

◆/ `MATR_RIGI = lme1`

List of the `matr_elem_*` allowing to establish the classification of the unknowns of the problem.

The goal of this operator is to number all the degrees of freedom of the problem. These degrees of freedom are those carried by elementary matrixes calculated by the operator `CALC_MATR_ELEM(lme1)`.

Because of dualisation of the "kinematical" conditions, the degrees of freedom of Lagrange are carried by the `matr_elem` calculated by option "RIGI_MECA" (or "RIGI_THER",...) on the loads where the kinematical conditions are defined.

It is thus important to give in `lme1`, the list of all the `matr_elem` of "stiffness" and not to forget the loads in operator `CALC_MATR_ELEM` [U4.61.01].

4.3 Operand `METHODE`

This operand is used to choose the method of resolution which one will apply to the future linear systems which will be built on the `nume_ddl` produced by this command. See the documentation of the key word `solver` [U4.50.01]

```
/ 'MULT_FRONT' method "multi_frontale" without swivelling  
/ 'MUMPS'      method "multi_frontale" with swivelling  
/ 'LDLT'      factorization of the type READ without swivelling  
/ 'GCPC'      conditioned pre conjugate gradient  
/ "PETSC"     access to the iterative solvers of the library PETSc
```

4.4 Operand `RENUM`

See the documentation of the key word `solver` [U4.50.01]

4.5 Operand INFO

◇INFO =

/1sur the message file .

- nombre total of degrees of freedom, many nodes,
- many degrees of freedom of LAGRANGE,
- maximum height a column (and average height),
- many stored terms (for storage "MORSE"),
- many blocks (for sky line storage),
- information concerning the renumbering.

5 Examples

See the examples in the command TO SOLVE [U4.55.02]