
Operator ASSE_ELEM_SSD

1 Drank

This operator aims to facilitate the task of the user for the assembly of the dynamic macro-elements. He connects the following commands: `DEFI_MODELE_GENE`, `NUME_DDL_GENE` and `ASSE_MATR_GENE`.

He produces a concept of the `modele_gene` type, and possibly a concept of the `nume_ddl_gene` type and concepts of the `matr_asse_gene_r` type.

This operator limits himself to the creation of the real generalized matrixes.

The generalized matrixes obtained are usable directly to compute: the eigen modes of `modele` generalized.

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2 Syntax

```
ASSE_ELEM_SSD (  
  
    ♦ RESU_ASSE_SSD = _F (  
        model ♦ MODELE=, [modele_gene]  
        ♦ NUME_DDL_GENE= nugene, [nume_ddl_gene]  
        ♦ RIGI_GENE= rigene, [matr_asse_gene_r]  
        ♦ MASS_GENE= magene, [matr_asse_gene_r]  
    ),  
  
    ♦ SOUS_STRUC = _F (  
        ♦ NOM = nom_ssti, [kN]  
        ♦ MACR_ELEM_DYNA =maceli , [macr_elem_dyna]  
        ♦ ANGL_NAUT = angln, [l_R]  
        ♦ TRANS = trans, [l_R]  
    ),  
  
    ♦ LIAISON= _F (  
        ♦ SOUS_STRUC_1 = nom_sst1, [kN]  
        ♦ INTERFACE_1 = nom_int1, [kN]  
        ♦ SOUS_STRUC_2 = nom_sst2, [kN]  
        ♦ INTERFACE_2 = nom_int2, [kN]  
        ♦ GROUP_MA_MAIT_1 = lgma1, [l_gr_maille]  
        ♦ MAILLE_MAIT_1 = lma1, [l_maille]  
        ♦ GROUP_MA_MAIT_2 = lgma2, [l_gr_maille]  
        ♦ MAILLE_MAIT_2 = lma2, [l_maille]  
        ♦ OPTION =/"CLASSIQUE", [DEFAULT]  
            /"REDUIT",  
    ),  
  
    ♦ VERIF= F (  
        see key word factor VERIF of DEFI_MODELE_GENE [U4.65.02]  
    ),  
  
    ♦ METHODE= /"CLASSIQUE", [DEFAULT]  
        /"ELIMINE",  
  
    ♦ STOCKAGE =/"LIGN_CIEL", [DEFAULT]  
        /"PLEIN",  
  
    ♦ INFO= /1, [DEFAULT]  
        /2,  
  
),
```

3 Course of computation

This operator connects the following operations:

- definition of modele generalized (DEFI_MODELE_GENE),
- classification of the degrees of freedom of modele generalized (NUME_DDL_GENE),
- assembly of the generalized matrixes (ASSE_MATR_GENE),

It is limited to the creation of the real generalized matrixes.

For his implementation, the user can take as a starting point the modelizations "E" and "F" of the case test sds106. These modelizations correspond respectively to the modelizations "B" and "D" of the same case test.

3.1 Key word RESU_ASSE_SSD

This key word factor defines the concepts of output.

3.1.1 Operand MODELS

♦ MODELS = model

model : modele generalized which contains the elements constituting total structure (assembled substructures).

3.1.2 Operand NUME_DDL_GENE

♦ NUME_DDL_GENE = nugene

nugene : classification of the degrees of freedom of total structure.

3.1.3 Operand RIGI_GENE

♦ RIGI_GENE = rigene

rigene : generalized stiffness matrix of total structure.

3.1.4 Operand MASS_GENE

♦ MASS_GENE = magene

magene : generalized mass matrix of total structure.

3.2 Key word SOUS_STRUC

Each occurrence of this factor key word makes it possible to define the characteristics of one substructure.

The description of the operands associated with this key word is the same one as that of key word SOUS_STRUC of operator DEFI_MODELE_GENE [U4.65.02].

Note:

By default, one considers that substructure neither a translation nor a rotation undergoes: $TRANS = (0. , 0. , 0.)$ and $ANGL_NAUT = (0. , 0. , 0.)$.

3.3 Key word LIAISON

Each occurrence of this factor key word makes it possible to define connection between two substructures. The description of the operands associated with this key word is the same one as that of key word LIAISON of operator DEFI_MODELE_GENE [U4.65.02].

Among the operands of this key word, operand OPTION makes it possible to choose the type of mode (static modes or modes of interface) which one adds besides the normal modes.

◇ OPTION

/"CLASSIQUE" : to each d.o.f. of the interface a static mode of connection/

"REDUIT corresponds" : use of the modes of interface (calculated beforehand with CREA_ELEM_SSD for example)

3.4 Key word VERIF

This key word makes it possible to check the coherence of modele generalized. The description of the operands associated with this key word is the same one as that of key word VERIF of operator DEFI_MODELE_GENE [U4.65.02].

3.5 Operand METHODE

This operand makes it possible to choose the way of numbering the degrees of freedom of modele generalized. Two choices are possible.

◇ METHODE

/"CLASSIQUE" : built a classification of the generalized degrees of freedom allowing the taking into account of the equations of connections between substructures by the method of the double Lagrange multipliers.

/"ELIMINE" : C onstruit a classification of the generalized degrees of freedom allowing the taking into account of the equations of connections by the method of elimination of the stresses on the variables.

3.6 Operand STOCKAGE

This operand makes it possible to choose the mode of storage of or the assembled matrixes.

◇ STOCKAGE

/"LIGN_CIEL" : mode of storage of type sky line

/"PLEIN" : one stores all the elements of the higher triangular part of the matrix.

3.7 Operand INFO

This operand makes it possible more or less to print information on the model generalized creates in the file "MESSAGE".

4 Example of use

This example is extracted from the case test sds106e

```
ASSE_ELEM_SSD (
  RESU_ASSE_SSD = _F (
    MODELS = CO ("MODEGE"),
    NUME_DDL_GENE = CO ("NUMEGE"),
    RIGI_GENE = CO ("RIGGEN"),
    MASS_GENE = CO ("MASGEN"),
  ),
  SOUS_STRUC = (
    _F (NOM = "CARRE1",
      MACR_ELEM_DYNA = MACEL1, ),
    _F (NOM = "CARRE2",
      MACR_ELEM_DYNA = MACEL2,
      TRANS = (0. , 0.5, 0.),
      ANGL_NAUT = (- 90. , 0. , 0.), ),
  ),
  LIAISON = (
    _F (SOUS_STRUC_1 = "CARRE1",
      INTERFACE_1 = "GAUCHE",
      GROUP_MA_MAIT_1 = "CALCUL",
      OPTION = "REDUIT",
      SOUS_STRUC_2 = "CARRE2",
      INTERFACE_2 = "BLOCKS", ),
  ),
  VERIF = _F (STOP_ERREUR = "OUI",
    accuracy = 1.E-6,
    CRITERE = "RELATIF"),
  METHODE = "ELIMINE",
),
```