Operator COMB_MATR_ASSE

1 Drank

To combine linearly, with real or complex coefficients, of the concepts of the matr_asse_* type.

This operator also allows to carry out linear combinations by considering only the real or imaginary part of a matrix with complex coefficients (extraction of the real or complex part of a matrix).

All the concepts of the matr_asse_* type to be combined, must share **same classification**, i.e. the two matrixes will have been assembled by the operator ASSE_MATRICE with the same concept argument for key word NUME_DDL (cf [U4.61.11]).

Product a data structure of the matr_asse_* type.

2 Syntax

```
cmass    [matr_asse_*] = COMB_MATR_ASSE    (
   ♦/COMB_R        =_F  (
                  ◊PARTIE    =         "REEL",
                                /    "IMAG",

                  ♦MATR_ASSE      = m ,    /    [matr_asse_DEPL_R]
                                           /    [matr_asse_TEMP_R]
                                           /    [matr_asse_PRES_R]
                                           /    [matr_asse_DEPL_C]
                                           /    [matr_asse_TEMP_C]
                                           /    [matr_asse_PRES_C]
                                           /    [matr_asse_GENE_R]
                                           /    [matr_asse_GENE_C]

                  ♦COEF_R    = R ,              [R]
                            ),
         /COMB_C    =_F  (
                  ♦MATR_ASSE      = m ,    /    [matr_asse_DEPL_R]
                                           /    [matr_asse_TEMP_R]
                                           /    [matr_asse_DEPL_C]
                                           /    [matr_asse_TEMP_C]
                                           /    [matr_asse_PRES_R]
                                           /    [matr_asse_PRES_C]
                                           /    [matr_asse_GENE_R]
                                           /    [matr_asse_GENE_C]

                  ♦/COEF_R        = R ,          [R]
                       /COEF_C    = C ,          [C]
                            ),
         /CALC_AMOR_GENE     = _F (
                  ♦/AMOR_REDUIT=           lr8,      [l_R]
                       /LIST_AMOR          = lisr8,  [listr8]
                  ♦MASS_GENE      = masgen,          [matr_asse_GENE_R]
                  ♦RIGI_GENE      = riggen,          [matr_asse_GENE_R]
                  ),
   ◊SANS_CMP  =    ' LAGR',
                  );

if COMB_R and MATR_ASSE:
                  [matr_asse_DEPL_R]  then      [*]  - >DEPL_R
                  [matr_asse_TEMP_R]       [*]  - >TEMP_R
                  [matr_asse_PRES_R]       [*]  - >PRES_R
                  [matr_asse_DEPL_C]       [*]  - >DEPL_R
                  [matr_asse_TEMP_C]       [*]  - >TEMP_R
                  [matr_asse_PRES_C]       [*]  - >PRES_R
                  [matr_asse_GENE_R]       [*]  - >GENE_R

if COMB_C and MATR_ASSE:
                  [matr_asse_DEPL_R]  then      [*]  - >DEPL_C
                  [matr_asse_TEMP_R]       [*]  - >TEMP_C
                  [matr_asse_DEPL_C]       [*]  - >DEPL_C
                  [matr_asse_TEMP_C]       [*]  - >TEMP_C
                  [matr_asse_PRES_R]       [*]  - >PRES_C
                  [matr_asse_PRES_C]       [*]  - >PRES_C
```

```
      if CALC_AMOR_GENE:
                       [matr_asse_GENE_R]  then      [*]  - >GENE_R
```

3 Operands

3.1 Key word COMB_R

/COMB_R

Description of the terms of the linear combination producing a matrix with **real coefficients**.

3.1.1 Operand PARTIE

◊ PARTIE = "REEL" ,
/ "IMAG" ,

to carry out extractions or linear combinations of part (S) imaginary (S) or real (S) of complex matrixes.

3.1.2 Operand MATR_ASSE

♦MATR_ASSE = m

Name of the concept matr_asse_* to be combined.

3.1.3 Operand COEF_R

♦COEF_R = R

real Coefficient to apply to the concept argument of MATR_ASSE.

3.2 Key word COMB_C

/COMB_C =

Description of the terms of the linear combination producing a matrix with **complex coefficients**.

3.2.1 Recall on the syntax of the complex values

the complex values can be declared in two different ways:

- in the form $a+ib$ with syntax "IH, has, B" where has and B are real numbers,
- in the form $(module, phase)$ with "MP MOD, pH" where MOD and pH are real numbers (pH in degrees).

3.2.2 Operand MATR_ASSE

♦MATR_ASSE = m

Name of the concept matr_asse_* to be combined.

3.2.3 Operands COEF_R/COEF_C

♦/COEF_R = R

real Coefficient to apply to the concept argument of MATR_ASSE.

/COEF_C = C

Coefficient complexes to apply to the concept argument of MATR_ASSE.

3.3 Key word CALC_AMOR_GENE

This key word makes it possible to build an object of the matr_asse_gene_R type corresponding to the damping matrix of Basile from a list of reduced dampings, (key word AMOR_REDUIT or LIST_AMOR).

```
MASS_GENE = masgen, RIGI_GENE = riggen,
```

masgen and riggen are the 2 generalized matrixes of mass and stiffness.

3.4 Operand SANS_CMP = "LAGR"

This operand causes to put in the "zero" terms of the matrix assembled result corresponding to the lines and the columns of the degrees of freedom of Lagrange.

4 Examples of classical

4.1 linear Combination use

```
mat_rs = COMB_MATR_ASSE (COMB_C =    (   _F ( MATR_ASSE = mat_1,
                                              COEF_R = 1.),
                                         _F ( MATR_ASSE= mat_2,
                                              COEF_C= ("IH", 0. , 1. ,),)
                                        ,),)
```

the product concept mat_rs is of the matr_asse_*_C type (complex):

```
   mat_rs = mat_1 + I mat_2
```

4.2 Recopy of a concept of the type matr_asse_*_R

```
mat_sauv = COMB_MATR_ASSE (    COMB_R = _F    (   MATR_ASSE = mat_1,
                                                  COEF_R = 1.))
```

4.3 Difference between COMB_C and COMB_R:

```
mat_R = COMB_MATR_ASSE (   COMB_R = _F    (   MATR_ASSE = mat_1,
                                              COEF_R = 1.))
```

#mat_Rest with coefficients réelsmat_R =mat_1

```
mat_C = COMB_MATR_ASSE (   COMB_C = _F    (   MATR_ASSE = mat_1,
                                              COEF_R = 1.))
```

#mat_C ' is with complex coefficients, but the imaginary part is nullemat_C =mat_1 + I. [0].

4.4 Extraction of the real part of a matrix of the type matr_asse_*_C

```
mat_R = COMB_MATR_ASSE     (   COMB_R = _F ( PARTIE = "REEL",
                                             MATR_ASSE = mat_C,
                                             COEF_R = 1. ,),
                           )
```