

Operator COMB_MATR_ASSE

1 Goal

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

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 concepts of the type `matr_asse_*` to combine, must divide **same classification**, i.e. the two matrices will have been assembled by the operator `ASSE_MATRICE` with the same concept argument for the keyword `NUME_DDL` (cf [U4.61.11]).

Product a structure of data of the type `matr_asse_*`.

2 Syntax

```

cmass [matr_asse_*] = COMB_MATR_ASSE (
  ◊   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]

  ◆   / COMB_R = _F (
        ◊   PART = / 'REAL' ,
                / '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 = lizr8, [lizr8]
        ◆   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 Keyword MATR_ASSE

/ MATR_ASSE

It is possible to crush an object `matr_asse` with the result of the operation. In this case, it is obligatory to specify here which object is re-used.

3.2 Keyword COMB_R

/ COMB_R

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

3.2.1 Operand PART

◇ PART = / 'REAL' ,
/ 'IMAG' ,

To carry out extractions or linear combinations of part (S) imaginary (S) or real (S) of complex matrices.

3.2.2 Operand MATR_ASSE

◆ MATR_ASSE = m

Name of the concept `matr_asse_*` to combine.

3.2.3 Operand COEF_R

◆ COEF_R = R

Real coefficient to apply to the concept argument of MATR_ASSE.

3.3 Keyword COMB_C

/ COMB_C =

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

3.3.1 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, p_H " where MOD and p_H are real numbers (p_H in degrees).

3.3.2 Operand MATR_ASSE

◆ MATR_ASSE = m

Name of the concept `matr_asse_*` to combine.

3.3.3 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.

3.4 Keyword CALC_AMOR_GENE

This keyword makes it possible to build an object of the type `matr_asse_gene_R` corresponding to the matrix of damping of Basile starting from a list of reduced depreciation, (keyword `AMOR_REDUIT` or `LIST_AMOR`).

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

`masgen` and `riggen` are the 2 generalized matrices of mass and rigidity.

3.5 Operand SANS_CMP = 'LAGR'

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

4 Examples of use

4.1 Classical linear combination

```
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 produced concept `mat_rs` is of the type `matr_asse_*_C` (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 enters COMB_C and COMB_R:

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

```
# mat_R is with real coefficients mat_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 worthless mat_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 ( PART = 'REAL',
```

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MATR_ASSE = mat_C,
COEF_R = 1. ,),

)