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 ( \\\n    \\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]

    \\\\n    \COEF\_R = R \ , [R]
    \COEF\_C = C \ , [C]

    \\\\
    \CALC\_AMOR\_GENE = _F ( \\\n    \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 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, pH” where MOD and pH are real numbers (pH 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

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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

```plaintext
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`

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

#### 4.3 Difference enters COMB_C and COMB_R:

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

# `mat_R` is with real coefficients

```
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`

```plaintext
mat_R = COMB_MATR_ASSE (COMB_R = F ( PART = ‘REAL’,
```

```plaintext
```
```
```
```plaintext
```plaintext
```plaintext
```
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MATR_ASSE = mat_C,
COEF_R = 1.,}

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