Macro command PROJ_BASE

1 Drank

To project matrixes and/or vectors assembled on a modal base or a basis of RITZ. The projected matrixes and vectors results will be used by the calculation algorithms out of generalized components (DYNA_TRAN_MODAL [U4.53.21] for example).

This macro-command replaces the following sequence controls:

- NUME_DDL_GENE [U4.65.03] which establishes the classification of the generalized degrees of freedom,
- one or more occurrences of PROJ_MATR_BASE [U4.63.12] to project one or more assembled matrixes,
- one or more occurrences of PROJ_VECT_BASE [U4.63.13] to project one or more assembled vectors.

Contents

2 Syntax

```
PROJ_BASE (
       ♦BASE=ba          ,                                    [mode_meca]
                                                            [mode_gene]
       ◊NB_VECT=/9999              ,                          [default]
                        /nm,                                   [I]

       ◊STOCKAGE=/              "PLEIN",                      [default]
                        /   "DIAG",

       ◊MATR_ASSE_GENE=_F          (
                              ♦MATRICE=CO          ("MT"),
[matr_asse_gene_r]
                              ♦/MATR_ASSE=ma             ,
[matr_asse_DEPL_r]
                                 /MATR_ASSE_GENE      =ma   ,
[matr_asse_gene_r]
                                    ),

       ◊VECT_ASSE_GENE=_F          (
                              ♦VECTEUR=CO          ("vt"),
[vect_asse_gene]
                              ◊TYPE_VECT=/          "FORC",  [default]
                                           /typ   ,       [kN]
                              ♦/VECT_ASSE=va             ,
[cham_no_depl_r]
                                 /VECT_ASSE_GENE      =va   ,
[vect_asse_gene]
                                    ),

       ◊RESU_GENE          =_F  (
                              ♦RESULTAT=CO          ("LMBO"),    [resu_gene]
                              ◊TYPE_VECT=/          "FORC",  [default]
                                           /typ   ,       [kN]
                              ♦/RESU        =va ,          [dyna_trans]
                                    ),

       ◊INFO=/1            ,                                  [default]
                    /2  ,
                 )
```

3 Operands

3.1 Operand BASE

♦BASE = Ba

Concept of the mode_meca type or mode_gene (for the substructuring), which contains the vectors defining the subspace of projection.

3.2 Operand NB_VECT

◊NB_VECT = Nm

Many vectors used in the base (one takes the Nm first). One checks that number Nm is quite lower than the number of vectors of the base, in the contrary case (Nm = 9999) one uses all the provided vectors.

3.3 Operand STOCKAGE

◊STOCKAGE=/ "PLEIN" [DEFAULT]
/"DIAG"

Confer NUME_DDL_GENE [U4.65.03].

If a matrix presents a profile "DIAG" and a another profile "PLEIN", two classifications will be created with NUME_DDL_GENE.

The use of the key word STOCKAGE=' DIAG' is licit when the base on which the matrixes are projected is made up of eigen modes. In this case, the projected matrixes are indeed diagonal, and it is not necessary to save the other terms of the matrix, which are null.

Attention, if the base is made up of other types of vectors (of the static modes for example), then the use of key word STOCKAGE=' DIAG' led to false results.
In the case of computations with use of the fluid-structure operators, computation must be made with the diagonal option of storage.

3.4 Key word MATR_ASSE_GENE

◊MATR_ASSE_GENE

Key word factor defining the name of the projected matrix result and the name of the matrix to be projected. This key word must be repeated as many times as there are matrixes to project.

3.4.1 Operand MATRICE

♦MATRICE = CO ("MT")

Concept of the matr_asse_gene_R type, matrix generalized result.

3.4.2 Operands MATR_ASSE/MATR_ASSE_GENE

♦/MATR_ASSE = my

Concept of the matr_asse_DEPL_R type, assembled matrix which one wishes to project.

/MATR_ASSE_GENE = my

Concept of the matr_asse_gene_R type, matrix assembled resulting from under - structuring, which one wishes to project.

3.5 Key word VECT_ASSE_GENE

◊VECT_ASSE_GENE

Key word factor defining the name of the vector project result and the name of the vector to be projected. This key word must be repeated as many times as there are vectors to project.

3.5.1 Operand VECTEUR

♦VECTEUR = CO ("vt")

Concept of the vect_asse_gene type, vector generalized result.

3.5.2 Operand TYPE_VECT

◊TYPE_VECT =typ

Character string describing the type of the field represented by the assembled vector, by default one expects a field of the type forces "FORC", the other possibilities are "DEPL", "QUICKLY" and "ACCE". The processing is different according to whether one uses the option FORC or the others.

•With option FORC, one carries out simple projection $\Phi^T f$, where Φ the base of modes and f formulel'effort,

•With the other options, one calculates by inverse problems the modal coefficients of participation associated with a given displacement. It is supposed that one can write the déplacementformulesous x the form $x=\eta^T \Phi$. Formula then $\eta=\Phi^T(\Phi^T\Phi)^{-1}x$ (pseudo-opposite of Moore-Penrose).

3.5.3 Operands VECT_ASSE/VECT_ASSE_GENE

♦/VECT_ASSE = goes

Concept of the type cham_no_DEPL_R, vector assembled which one wishes to project.

/VECT_ASSE_GENE = goes

Concept of the type vect_asse_gene, assembled vector resulting from the substructuring, which one wishes to project.

3.6 Key word RESU_GENE

◊VECT_ASSE_GENE

Makes it possible to project a data structure of dyna_trans type result (resulting from a linear computation of dynamics, or reading of a data file). This key word must be repeated as many times as there are vectors to project.

3.6.1 Operand RESULTAT

♦RESULTAT = CO ("LMBO")

Concept of the resu_gene type, vector generalized result.

3.6.2 Operand TYPE_VECT

◊TYPE_VECT =typ

Character string describing the type of the field represented by the assembled vector, by default one expects a field of the type forces "FORC", the other possibilities are "DEPL", "QUICKLY" and "ACCE". The processing is different according to whether one uses the option FORC or the others.

•With option FORC, one carries out simple projection $\Phi^T f$, where Φ is the base of modes and f force

•With the other options, one calculates by inverse problems the modal coefficients of participation associated with a given displacement. It is supposed that one can write the déplacementsous x the form $x=\eta^T \Phi$. Formula then $\eta=\Phi^T(\Phi^T\Phi)^{-1}x$ (pseudo-opposite of Moore-Penrose).

3.6.3 Operands RESU

♦/RESU= LMBO

Concept of the dyna_trans type, data structure result that one wishes to project.

3.7 Operand INFO

◊INFO=/ 1 [DEFAULT]
/2

Level of printing of information for command NUME_DDL_GENE (confer [U4.65.03]).

4 Example of use

```
# transient dynamics on system modal base masses and arises
PROJ_BASE (       BASE=MODES,
                  MATR_ASSE_GENE= (
                       _F (MATRICE = CO ("MASSEGEN"),
                          MATR_ASSE = MATRMASS),
                       _F (MATRICE = CO ("RIGIDGEN"),
                          MATR_ASSE = MATRRIGI),
                       _F (MATRICE = CO ("AMORTGEN"),
                          MATR_ASSE = MATRAMOR,
                          STOCKAGE = "PLEIN")),
                  VECT_ASSE_GENE=
                       _F (VECTEUR = CO ("EFFOGENE"),
                          VECT_ASSE = VECTASS))
                  );
```