Operator CALC_TRANSFER

1 Goal

This order makes it possible to calculate the transfer transfer function of a linear system between two points. It is also possible to obtain the answer in an unspecified point of the digital model according to an output signal indicated by the user.

This operator uses in data input, the answers of the mechanical system to one-way requests preferably of type white vibration. He produces one or two structure of data of the type `table`, one for the matrix of transfer transfer function, the other for the possible calculated signal.

Product one or more structures of data of the type `table`.

2 Syntax

```
CALC_TRANSFERT  (

    ♦  RESULTAT_X   = resu_x ,                          /  [dyna_trans]
                                                        /  [dyna_harmo]
                                                        /  [harm_gene]
                                                        /  [tran_gene]

    ♦  RESULTAT_Y   = resu_y ,                          /  [dyna_trans]
                                                        /  [dyna_harmo]
                                                        /  [harm_gene]
                                                        /  [tran_gene]

    ◊  RESULTAT_Z   = resu_z,                       /  [dyna_trans]
                                                        /  [dyna_harmo]
                                                        /  [harm_gene]
                                                        /  [tran_gene]
    ♦  NOM_CHAM     =  /  'ACCE',
                       /  'QUICKLY',
                       /  'DEPL',

    ♦  ENTRY     =  _F (
       ♦  | GROUP_NO   =  lgno,                            [l_gr_noeud]
          | NODE    =  lnoe, ),                          [l_noeud]

    ♦  EXIT      =  _F (
       ♦  | GROUP_NO   =  lgno,                            [l_gr_noeud]
          | NODE    =  lnoe, ),                          [l_noeud]

    ◊  REFERENCE MARK         =  /  'ABSOLUTE'   ,

                              /  'RELATIVE'   ,                  [DEFECT]
                              ♦  TRAINING = _F (
                                    ♦    DX = entr_x,           [function]
                                    ♦    DY = entr_y,           [function]
                                    ◊    DZ = entr_z,),       [function]

  ◊  SIGNAL       =  _F (
       ♦  MESURE_X     =  f_x,                               [function]
       ♦  MESURE_Y     =  f_y,                               [function]
       ◊  MESURE_Z     =  f_z,                               [function]
       ♦  TABLE_RESU   =  CO ('table'), ),                   [table]
       ◊  TYPE_RESU    =  /  'TEMPORAL',
                          /  'HARMONIC',                     [DEFECT]
```

3 Description of the macro order and preliminary stages

The order CALC_TRANSFERT allows to calculate the matrix transfer function transfer between two points of the structure. It also makes it possible to the user to determine the signals in a point of the structure knowing the signals in another point of the structure.

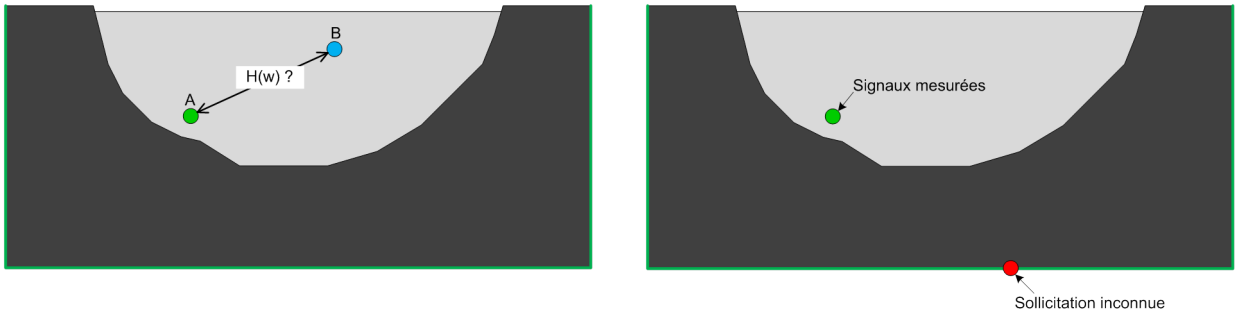


Figure 1 – Representation schematic of the use of the macro order

Prior to the use of the order, the user must carry out several dynamic calculations under one-way request. For example if the study is in 3D (resp. 2D), it must carry out 3 calculations (resp. 2 calculations) exciting one of the three (resp. 2) directions. It is preferable to carry out dynamic calculations via a mono-directional white vibration.

Dynamic calculations must be carried out with the same list of frequencies if calculation is harmonic and with the same list of time if calculation is transitory. For a transitory calculation, the user must take care to have a list with constant step. In the contrary case an error message will be transmitted to him because the transform of Fourier necessary to various calculations required a constant step.

Dynamic calculations will have to be in the same way standard, that is to say tran_gene, that is to say harm_gene, that is to say dyna_trans or dyna_harmo.

When the user must inform the functions of training and/or the signals measured, it is preferable that the latter is discretized on the same list of frequencies (case of a harmonic calculation) or on the same list of time (case of a transitory calculation).

4 Operands

4.1 ConceptS createdS by the order

This order creates at exit a concept of the type counts. It is possible to also leave a second table containing the signals calculated using the measured signals.

The first concept produces some is the use of the macro_commande by the user is a table which as follows contains the data of the matrix transfer function transfers arranged:

- The first column corresponds to frequencies (FREQ);
- The following ones correspond to the elements of the matrices arranged in the order by lines Hxx, Hxy, Hxz, Hyx, Hyy, Hyz, Hzx, Hzy and Hzz. In the case 2D, there will be Hxx, Hxy, Hyx and Hyy.

$$\underline{\underline{H}}(\omega)=\begin{pmatrix} H_{xx} & H_{xy} & H_{xz} \\ H_{yx} & H_{yy} & H_{yz} \\ H_{zx} & H_{zy} & H_{zz} \end{pmatrix}$$

4.2 Operands RESULTAT_X, RESULTAT_Y and RESULTAT_Z

♦ RESULTAT_X = resu_x

Name of the concept of the type Resultat for which calculation was carried out with a request one-way according to X.

♦ RESULTAT_Y = resu_y

Name of the concept of the type R esultat for which calculation was carried out with an one-way request following there .

◊ RESULTAT_Z = resu_z

Name of the concept of the type R esultat for which calculation was carried out with an one-way request according to Z .

Note:

> *Only the structures result of the type dyna_trans , dyna_harmo , tran_gene and harm_gene can be well informed in these operands.*
> *The calculations produced by the operators of dynamics and who are to be informed in the operands RESULTAT_X , RESULTAT_Y and RESULTAT_Z must be in the same way standard: dyna_trans , or dyna_harmo or tran_gene or harm_gene.*

4.3 Operands NOM_CHAM

♦ NOM_CHAM = nomcha

Reference symbol of the field which one wishes to extract from dynamic calculations realized as a preliminary by the user and informed in the operands RESULTAT_X, RESULTAT_Y and RESULTAT_Z. The possible names of the field are: 'DEPL','QUICKLY'and'ACCE'

Note:

> *Various functions indicated by the user such as the functions of training indicated in the word-key TRAINING or functions measured well informed in the keyword SIGNAL will have to be of the same type as **nomcha** .*

4.4 Operand REFERENCE MARK

♦ REFERENCE MARK = /'ABSOLUTE'
/'RELATIVE'

This obligatory operand makes it possible to inform the type of answer calculated by the dynamic operators. If the reference mark is RELATIVE, then the user must inform the signal of training in the keyword ENTRAINTEMENT (see paragraph 4.5).

4.5 Keyword TRAINING

The keyword factor TRAINING allows to inform the requests of training having been used to carry out various linear dynamic calculations.

♦ DX = entr_x
This operand makes it possible to inform the one-way request (according to direction X) used for p R dynamic emier calculation.

♦ DY = entr_y

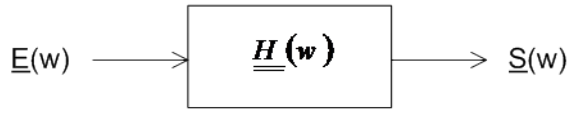
This operand makes it possible to inform the one-way request (according to the direction there) used p our the second dynamic calculation.

◊ DZ = entr_z
This operand makes it possible to inform one-way request (according to the direction) Z used for the third dynamic calculation.

4.6 Keywords ENTRY and EXIT

♦ | GROUP_NO = lgno
| NODE = lnoe

The keywords factor ENTRY and EXIT allow to inform the name of the node (lnoe) or the name of a group of node (grno) container only one node on which carry the extraction of the field 'DEPL'or'QUICKLY'or 'ACCE'



4.7 Keyword SIGNAL

This keyword factor (optional) makes it possible to determine the dynamic stress having led to the measured signals indicated by the user in the keyword factor SIGNAL.

4.7.1 Operands MESURE_X,MESURE_Y and MESURE_Z

♦ MESURE_X = f_x
This operand makes it possible to inform the signal measured according to direction X.

♦ MESURE_Y = f_y
This operand makes it possible to inform the signal measured according to direction Y.

◊ MESURE_Z = f_z
This operand makes it possible to inform the signal measured according to direction Z.

Note:

*The signals must be in the same way standard than **nomcha** and must be discretized over the same list of frequencies or time.*

4.7.2 Operand TYPE_RESU

◊ TYPE_RESU = /'TEMPORAL',
/'HARMONIC'

This operand makes it possible to inform the type of results wished at exit of the table.

4.7.3 Operand TABLE_RESU

♦ TABLE_RESU = nom_table

This operand makes it possible to inform the name of the table in which will appear the calculated signals knowing the measured signals.
The table will be made up of several columns arranged like such:
If TYPE_RESU = 'TEMPORAL' :

```
    INST, FX, FY, FZ
  If TYPE_RESU = 'HARMONIC' :
    FREQ, Re_FX, Im_FX, Re_FY, Im_FY, Re_FZ, Im_FZ
```