Code_Aster

Titre : Opérateur DEFI_SOL_MISS
Responsable : COURTOIS Mathieu

Version default

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Clé : U7.02.34   Révision :
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Order DEFI_SOL_MISS

1   Goal

To produce a table containing of the necessary information to the description of a file of ground for software MISS3D.

Data entered by the order DEFI_SOL_MISS are:

- the description of the characteristics of materials constitutive of the layers of a laminated ground,
- the geometrical description and the assignment of materials of the successive layers,
- positioning (which can be defined in an automatic way) levels sources and receivers compared to the soil horizons necessary to the calculation of the functions of Green.

The table of ground thus produced will be provided in argument of CALC_MISS [U7.03.12].

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2   Syntax

```
tabsol [table] = DEFI_SOL_MISS    (


        ♦  MATERIAL = _F    (  ♦  E        = Young,           [R]
                               ♦  NAKED       = naked   ,              [R]
                               ♦  RHO         = rho,              [R]
                               ♦  AMOR_HYST = beta,             [R]
                          ),
        ♦ /   SLEEP = _F      (
                        ♦ /  THICK        = thick,         [R]
                          ♦  NUME_MATE    = numat,         [I]
                          ◊  SOURCE      = /  'NOT',       [DEFECT]
                                           /  'YES',
                          ◊  RECEIVER  =  /  'NOT',    [DEFECT]
                                           /  'YES',

                          /  SUBSTRATUM     = /  'NOT',    [TXM]
                                              /  'YES',
                           ♦ NUME_MATE     = numat   ,       [I]
                          ),
          /  COUCHE_CAR = _F     (
                          ◊   Z0            = z0 ,       [ R ]
                          ♦  HOMOGENEOUS    = /  'YES',    [TXM]
                                             /  'NOT',
                          ◊   SURFING        = /  'NOT',    [DEFECT]
                                              /  'YES',
                          ♦  EPAIS_PHYS   = l_thick,       [l_R]
                          ◊   GROUP_MA_CONTROL = grmapc ,   [grma]
                          ◊   GRID      = e-mail ,       [grid]
                        If HOMOGENEOUS =   'NOT':
                          ♦  NUME_MATE     = l_numat ,       [l_I]
                          ♦  NUME_MATE_SUBSTRATUM = numat, [I]
                        If SURFING = 'NOT':
                          ♦ /   GROUP_MA     = grma ,      [grma]
                            /   GROUP_NO     = grno ,      [grno]
                          ◊   NOMBRE_RECEPTEUR = /nbrecep, [I]
                                               /4,       [DEFECT]
                          ◊   GROUP_MA_INTERF   = grma,    [grma]
                          ◊   TOLERANCE      = /  sheet ,    [R]
                                              /  1, E-5,    [DEFECT]
                          ◊   DECALAGE_AUTO = /  'YES',    [DEFECT]
                                             /  'NOT',
                     ),

        ◊  INFORMATION =   /  1,
    [DEFECT]
                      /  2,

        ◊  TITLE =       title,                        [l_Kn]

    )
```

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3   Operands

3.1   Keyword MATERIAL

MATERIAL

Keyword factor répétable allowing the description of the characteristics of materials constitutive of the layers of a laminated ground, material by material.

The assignment of materials on the various layers is done by the number of occurrence of the keywords factors MATERIAL. It is not allowed to be unaware of certain materials. For example, one cannot use materials 1.2 and 4 pennies SLEEP or COUCHE_AUTO, without affecting the occurrence number 3. The order stops in error in this case. On the other hand, one can define 4 materials and use only the first, 1 and 2 for example.

3.1.1   Operands E/NU/RHO/AMOR_HYST

Allow respectively to define the actual values of Young, the Poisson's ratio modulus, density and damping hysteretic of current material.

3.2   Keyword SLEEP

SLEEP

Keyword factor répétable allowing the geometrical description and the assignment of materials sleeps by layer, the possible positioning of a level source and receiver compared to the current soil horizon, which is necessary to the calculation of the functions of Green.

Notice :
> *The description of the layers is done obligatorily in the vertical direction going down*

3.2.1   Operand NUME_MATE

♦   NUME_MATE = numat

Number of material in the order of description of the occurrences of the keyword MATERIAL current layer

3.2.2   Operands THICK/SUBSTRATUM

Either one defines the layer as substratum (SUBSTRATUM=' YES'), in general for the last layer.
Either one provides the value thickness of the layer.

3.2.3   Operands SOURCE/RECEPTEUR

Allow to determine whether one respectively positioned a level source and/or receiver at the top of the current layer if 'OUI'.

3.3   Keyword COUCHE_CAR

COUCHE_CAR

Keyword factor single allowing automated definition of the soil horizons, in parallel of the manual mode of the keyword SLEEP.

3.3.1   Operand Z0

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◊   Z0 = z0

Vertical dimension of free surface (argument identical to that of CALC_MISS [U7.03.12]). If one do not inform its value, then the operator will detect the vertical dimension highest of GROUP_NO/GROUP_MA, in agreement with GROUP_MA_INTERF if it is defined.

3.3.2 Operand HOMOGENEOUS

♦   HOMOGENEOUS   = / 'YES',
                       / 'NOT',

This keyword makes it possible to specify if the ground is homogeneous or not. In the second case, it is obligatorily necessary to define the stratification of ground with the operands NUME_MATE/EPAIS_PHYS and the material of the substratum (homogeneous and semi-infinite soil horizon lowest) with NUME_MATE_SUBSTRATUM . The number of values of EPAIS_PHYS must be coherent with that of NUME_MATE : each layer must have an associated material, therefore if there are N layers (thus N values in the list of realities of EPAIS_PHYS) then the list of entireties of NUME_MATE must be also length N.
In the homogeneous case, one will take first material of the keyword MATERIAL and there remains right to define the position of the substratum with EPAIS_PHYS who will contain only one value. In the case of an inserted foundation, the substratum must be positioned low than the base of the foundation.

3.3.3 Operand SURFING

◊   SURFING   = / 'NOT',   [DEFECT]
                       / 'YES',

D allows'to indicate if the foundation is surface or not. If it is not it, then it is also necessary to define certain operands as GROUP_MA or GROUP_NO who will allow to define the side underlayers of ground.
In the surface case, these operands do not have a direction, as well as others: NOMBRE_RECEPTEUR, TOLERANCE, DECALAGE_AUTO, GROUP_MA_INTERF ET GRID.

3.3.4 Operand EPAIS_PHYS

D allows'to indicate the thickness of the soil horizons. In the case of a homogeneous ground it is just used to position the substratum (which must be under the point low of the foundation).

3.3.5 OperandS NUME_MATE/NUME_MATE_SUBSTRATUM

Allowstent to associate a material (according to its number in the order of description of the occurrences of the keyword MATERIAL) with each soil horizon and the substratum.

3.3.6 OperandS GROUP_MA/GROUP_NO/GRID

Allowstent to give the group of mesh or group of nodes which will use to define the vertical dimensions of the nodes of the grid of the interface, for the definition of the underlayers of ground, therefore only in the case of an inserted foundation. One recommends the use of GROUP_MA because one can then detect if the grid of the foundation is quadratic or linear, which one cannot do with a group of nodes. This detection is important because MISS3D takes into linear account only one discretization: the nodes mediums must thus be been unaware of for the definition of the underlayers of ground and thus the positions of the sources and associated receivers.
One must also specify the grid of the model.

3.3.7 Operand NOMBRE_RECEPTEUR

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Defines the number of underlayers of the table of ground and which correspond to the inserted part of the foundation, *cf.* U2.06.07 documentation. The value by default is of four per element and one authorizes only one even value.

3.3.8 OperandS GROUP_MA_INTERF / TOLERANCE

The definition of GROUP_MA_INTERF will allow to start a checking of coherence between this group of meshs of interface FEM-BEM Aster-MISS3D and the argument of GROUP_MA/GROUP_NO. One thus checks the vertical dimensions of the nodes, with a certain relative tolerance, which is worth 1.E-5 by default. This checking has direction only if the e-mailGe of the foundation complies with the rules of U2.06.05 documentation and which is imposed by MISS3D which considers a vertical discretization of 1D type.
In shallow foundation, this checking does not have relevance.

3.3.9 Operand GROUP_MA_CONTROL

Allows to define the check-points in the ground, in a way similar to what is made in CALC_MISS [U7.03.12]. The table of ground must indeed take account of the presence of check-points, as indicated in U2.06.07 documentation.
If all the check-points are on free surface, it is useless to inform the keyword GROUP_MA_CONTROL.

3.3.10 Operand DECALAGE_AUTO

◊   DECALAGE_AUTO = /   'YES',   [DEFECT]
                    /   'NOT',

If the position of the limit between two soil horizons (with a strong material contrast) corresponds exactly to the base of the buried foundation, that can generate a digital singularity in MISS3D. Thanks to this option, one thus proposes to shift in an automatic way the limit of these soil horizons. For that, one will shift this limit thickness of an underlayer to the top (for example the height of the quarter of an element if one left the value of NOMBRE_RECEPTEUR to four).

3.4   Operand TITLE

◊   TITLE = title
Allows the user to define a title for the table of ground.

3.5   Operand INFORMATION

Indicate a level of impression for information in the file "MESSAGE":
    INFORMATION = 1 : no impression
    INFORMATION = 2 : impression of the table of ground