Order **DEFI_CHAR_GROUND**

## 1 Goal

Produce an usable load in the operators of dynamic resolution `DYNA_VIBRA` and `DYNA_NON_LINE` for pto ouvoir to take into account seismic loads at the borders of fields of ground 2D or 3D. The loads created concern two sources potentially: either of the loads of type “plane wave” deduced from movements imposed on the side borders in the direction of propagation, or of the complements of second member of the type “forces nodal” imposed on the side borders in the transverse directions with the propagation.

The data of imposed movement or fields of force can also come from two sources: that is to say a file result of transitory evolutions resulting from an auxiliary calculation of column of ground 2D by `DEFI_SOL_EQUI`, that is to say an evolution of type result calculated on a model auxiliary and projected on the borders of the field.

She takes into account the concomitance of these alternative choices:
- source of the transitory data of movements or forces at the borders: that is to say a unit of transitory results got by `DEFI_SOL_EQUI` for the auxiliary calculation of column of ground 2D behind the keyword `UNITE_TRAN_UNIT` and in this case one informs coherent data with `DEFI_SOL_EQUI`; that is to say a result of transitory evolutions at the borders of the basin calculated on an auxiliary model 2D or 3D entered behind the keyword `RESU_INIT` and coherent with the new syntax of `CREA_RESU`. In both cases, it is necessary to specify the type of load plane wave or force imposed by the keyword `LOADING`. 

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2 Syntax

tank ground [ char_meca ] = DEFI_CHAR_GROUND {

    MODELE = m0, [modelE]
    /
    /♦ UNITE_TRAN_INIT = utrin, [Links (In)]
    /
    /♦ RESU_INIT = resui,
    /
    [dyna_trans]
    /
    [evol_char]
    /
    [evol_noli]

    LOADING =/ 'FORCE', [DEFECT]
    /
    'ONDE_PLANE',

    # If UNITE_TRAN_INIT
    {
        ◊ NOM_CMP =/ 'DX', [DEFECT]
        /
        'DY',
        ◊ LENGTH_CARAS = lcar has,
        / [R]
        /
        | ♦ GROUP_MA_DROITE = gmdr, [grma]
        /
        | ♦ GROUP_MA_GAUCHE = gmga, [grma]
        /
        TABLE_MATER_ELAS = tmela, [table]
        ◊ Z0 = /z0 ,
        /
        [DEFECT]
        /
        = / 0. ,
        /
        [DEFECT]
        ◊ AXIS =/ 'X',
        /
        'Y',
        /
        'Z',
        /
        [DEFECT]
        /
        | ♦ NOM_PARA =/ 'Y',
        /
        'Z',
        /
        [DEFECT]
    } # End If UNITE_TRAN_INIT

    # If RESU_INIT
    {
        ◊ MATR_AMOR = matr_has, [matr_asse_depl_r]
        /
        MATR_RIGI = matr_k, [matr_asse_depl_r]
        ◊ NUME_DDL = digital,
        / [nume_ddl]
        /
        MATR_RIGI = matr_k,
        / [matr_asse_depl_r]
        ◊ INST = inst,
        /
        [R]
        /
        LIST_INST = linst, [l_R]
        ◊ NOM_CHAM_INIT = / 'FORC_NODA', [DEFECT]
        /
        'PULLEYC_NODA',
        /
        'ACCE',
        /
        [DEFECT]
        /
        DDL_EXCLUS = / 'DX',
        /
        'DY',
        /
        'DZ',
        /
        'DRX',
        /
        'DRY MARTINI',
        /
        'DRZ',
        /
        [DEFECT]
        /
        CRITERION = / 'ABSOLUTE',
        /
        'RELATIVE', [DEFECT]
        ◊ PRECISION = / prec,
        /
        1.0E-6, [DEFECT]
        ◊ COEFF = / coeff,
        /
        1.0, [DEFECT]
    } # End If RESU_INIT

    ◊ INFORMATION = / 1, [DEFECT]
    /
    2,
    ◊ TITLE = title, [l_Kn]
3 Operands

3.1 Operand MODELE

♦ MODELE = mO

Permet de définir le nom de modèle à auquel sera affectée la charge. Selon la dimension du problème, ils doivent être en 2D un modèle de déformations planes (‘D_PLAN’), ou en 3D d’un modèle voluminal avec un modèle 3D.

3.2 Operand LOADING

◊ LOADING = / ‘ONDE_PLANE’,
     / ‘FORCE’,

Indique la nature de la charge imposée :

- LOADING = ‘ONDE_PLANE’ : charge sous forme de vagues planes de propagation verticale imposée sur le modèle et déduite du mouvement en vague plane imposée sur une colonne 2D ou un autre modèle auxiliaire. La vague est de cisaillement si il y a un mouvement horizontal de demande, il est de pression s’il y a un mouvement vertical de demande.

- LOADING = ‘FORCE’ : charge sous forme de forces opposées imposées sur les bords de la modélisation.

3.3 Operand UNITE_TRAN_INIT

Fournit le unit de écriture au format ‘TABLE’ des évolutions transitoires chaque niveau d’un modèle 2D de sol stratifié obtenu au moment d’une première appel avec DEFI_SOL_EQUI. À l’époque de ce dernier appel, les évolutions sont créées à l’aide de la clé UNITE_RESU_TRAN. Les charges imposées sur le modèle sont extraites sous la forme de tableaux de forces en fonction du temps et de la dimension sur la stratification à partir du fichier correspondant à cette unite.

3.3.1 Operand NOM_CMP

◊ NOM_CMP = / ‘DX’, [DEFECT]
     / ‘DY’,

Indique la direction de signal imposée sur le modèle stratifié 2D qui a été utilisé pour obtenir les résultats des évolutions transitoires à imposer comme conditions de bords :

- NOM_CMP = ‘DX’ : signal imposé est horizontal (correspond à une onde de cisaillement de propagation verticale);

- NOM_CMP = ‘DY’ : signal imposé est vertical (correspond à une onde de pression verticale).

3.3.2 Operand AXIS

◊ AXIS = / ‘X’,
     / ‘Y’,
     / ‘Z’,

Indique la direction de la charge imposée avec le modèle. Ce paramètre est nécessaire en 3D et rend possible l’activation de ce cas de charge.

Note : ce mot-clé n’est pas nécessaire en 2D car la direction de la charge dépend de la nature de la charge et la direction du signal : pour NOM_CMP = ‘DX’, on a ‘X’ pour LOADING = ‘ONDE_PLANE’ et ‘Y’ pour LOADING = ‘FORCE’. Contrairement à NOM_CMP = ‘DY’.

3.3.3 Operand NOM_PARA

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allows to only specify in 3D, the direction DE propagation of the signal of plane wave generating the force to be applied and corresponding to the vertical direction of the model. This operand is not necessary in most case because he generally results from the direction of the signal imposed on the column of ground by NOM_CMP and of the direction of the load imposed on the model by AXIS. But for NOM_CMP = ‘DY’, and AXIS = ‘X’, for example, one can have a parameter of propagation for a loading of the type ‘FORCE’ as well in the direction ‘Y’ that in the direction ‘Z’. And for NOM_CMP = ‘DX’, and AXIS = ‘X’, for a loading of the type ‘ONDE_PLANE’, one can have a wave as well HS in the direction ‘Y’ qu’one wave SV in the direction ‘Z’.

One considers however a value by default ‘Z’ as a vertical direction for a 3D problem.

3.3.4 Operands GROUP_MA_DROITE/GROUP_MA_GAUCHE

|◊ GROUP_MA_DROITE = gmda
|◊ GROUP_MA_GAUCHE = gmga

Permettent respectively to define the names of the groups of meshes représentatifs flat rim and left edge model to which serhas affected the load. One must inform at least one of these operands. These groups of meshes are linear in 2D and surface in 3D, except in the case loading of the type ‘FORCE’ in 3D where one must define linear groups of meshes encircling the edges of the model.

3.3.5 Operand TABLE_MATER_ELAS

Indicate the table which contain information on the geometrical description of the horizons soil laminated and that of the initial characteristics of materials constitutive of these layers, sleeps by layer. It corresponds to the table produced by the call to DEFI_SOL_EQUI who also produced the file entered by UNITE_TRAN_INIT.

3.3.6 Operand Z0

Indicate, the dimension of free surface, worthless by default, of the model to which to make correspond geometrically the worthless dimension of the model of column of ground 2D.

3.3.7 Operand LONG_CARA

Indicate, in the case of a loading plane wave, the value characteristic length defined in DEFI_MATERIAU keyword ELAS allowing to calculate of rigidity added on the absorbing border constituted by edge S right and left of the column of ground.

3.4 Operand RESU_INIT

Provides the name of the result of the transitory evolution calculated on a model to auxiliarE from which one must extract the fields from speed, displacement or nodal force necessary to the generation of the evolutions second member to be applied like limiting conditions to the edges of the model.

3.4.1 Operand COEFF

|◊ COEFF = / 1.0, [DEFECT]
|/ coef

Give the factor of combination to apply a loading in the case of type ‘FORCE’. It can be necessary to apply factors -1 in the case of wave of pressure P or in the case of wave of shearing S on the fields of nodal forces calculatedS on model to auxiliarE result of origin entered behind the keyword RESU_INIT.
3.4.2 Operands MATR_AMOR / MATR_RIGI

- MATR_AMOR = matr_has
- MATR_RIGI = matr_k,

In the case of one loading of the type ‘ONDE_PLANE’, NomS of assembled matrices of damping and of rigidity (optional) that one uses in the products \( KU + CV \) constituting the evolution second member produced from which one can create the load to be applied to the model.

3.4.3 Operands NUME_DDL / MATR_RIGI

- / MATR_RIGI = matr_k
- / NUME_DDL = digital,

In the case of one loading of the type ‘FORCE’, Entrées from which one can obtain the classification of reference or conversion of the evolution second member produced from which one can create the load to be applied to the model.

3.4.4 Operands INST / LIST_INST / PRECISION / CRITERION

- INST = litps
  List of actual values moments of calculation DU result of origin.
- LIST_INST = litps
  List of realities produced by DEFI_LIST_REEL [U4.34.01] moments of calculation of the produced evolutions.
- PRECISION = / prec [R] / 1.0D-6 [DEFECT]
  Precision used to search the moment specified in the result of origin.
- CRITERION = / ‘RELATIVE’, / ‘ABSOLUTE’,

Criterion used to search the moment specified in the result of origin.

3.4.5 Operand NOM_CHAM_INIT


Name of field of result DE L’evolution of departure calculated of type evol_char or dyna_trans that one converts then in the field of the result of the evolution second member DE type evol_char transform in load.

3.4.6 Operand DDL_EXCLUS

- DDL_EXCLUS = nom_cmp [TXM]

Name of component to be excluded at once result DE L’evolution of departure calculated of type evol_char or dyna_trans that one converts then in the field of the result of the evolution second member DE type evol_char transform in load. Applies in general to a field ‘FORC_NODA’. All the field is taken if the keyword is not indicated.

3.5 Operand TITLE

- TITLE = title
Allows the user to define a title for LE loading.

### 3.6 Operand **INFORMATION**

◊ IN\_INFORMATION =

Indicate a level of impression for information in the file "MESSAGE":

- INFORMATION = 1: no impression
- INFORMATION = 2: impression information on the loading.