

Manuel d'Utilisation
U4.0- booklet: Use of the orders
Document: U4.01.05

Innovations and modifications of version 9

Summary:

The object of this document is to give a comprehensive view of the modifications of syntax and new opportunities of the orders of *Code_Aster* intervened during the development of version 9, i.e. since version 8.4.

The index B of this document thus mentions changes introduced since **version 9.1** from June 2007 and valid for **version 9.2** from December 2007.

The paragraph 2 draft of the syntactic evolutions which have occurred between version 8.4 (December 2006) and version 9.1 (June 2007).

For more precise details, one will consult the documentation of the orders and the file `histor` corresponding under-version (e.g.: [9.1.7], section *Support/Histor* site www.code-aster.org). The impacted orders are listed alphabetically.

1 Innovations between 9.1 and 9.2

1.1 New orders

1.1.1 CALCULATION

The object of this new ordering of is calculated the elementary tangent matrices, the elementary internal forces and to integrate the law of behavior (cf [9.1.7]).

Its principle is, knowing U, SIGMA, VARI- and , one calculates:

- SIGMA+, VARI+, elementary tangent matrices, the elementary vectors residues if OPTION= ('BEHAVIOR', 'FORC_INT_ELEM', 'MATR_TANG_ELEM')
- SIGMA+, VARI+, the elementary vectors residues if OPTION= ('BEHAVIOR', 'FORC_INT_ELEM')

1.1.2 TO FACTORIZE and TO SOLVE replace FACT_GRAD/FACT_LDLT and RESO_GRAD/RESO_LDLT

Orders FACT_GRAD and FACT_LDLT amalgamated in only one: TO FACTORIZE.

In the same way for RESO_GRAD and RESO_LDLT who amalgamated in TO SOLVE (cf [9.1.14]).

The keyword MATR_FACT of RESO_LDLT becomes MATR.

The keyword MATR_ASSE of RESO_GRAD becomes MATR, and MATR_FACT becomes MATR_PREC.

1.2 General modifications

1.2.1 Variables of order

The use of the temperature as variable of order in mechanics must now be done while using AFFE_MATERIAU/AFFE_VARC/NOM_VARC=' TEMP' instead of AFFE_CHAR_MECA/TEMP_CALCULEE.

Old syntax TEMP_CALCULE will have disappeared in the next version.

See the remark concerning the temperature of reference § AFFE_MATERIAU/TEMP_REF.

1.2.2 Behavior ELAS_VMIS_PUIS

This behavior are equivalent of VMIS_ISOT_PUIS in linear elasticity is available since 9.1.15.

The keyword ELAS_VMIS_PUIS (analogue of ELAS_VMIS_TRAC) appears in the orders STAT_NON_LINE, DYNA_NON_LINE and CALC_G.

1.2.3 Parallel Solveur MUMPS distributed

This evolution consists in calling solver MUMPS in parallel version distributed in opposition to the centralized parallel version. In both cases, the resolution of the linear system is to make in parallel on several nodes and processors of the machine. In the version distributed, one distributes on the various processors the calculation of the elementary matrices, then the assembly and finally the resolution of the system. The mode of distribution is selected via the keyword PARALLELISM.

The operators concerned are DYNA_LINE_TRAN, DYNA_NON_LINE, MECA_STATIQUE, THER_LINEAIRE, THER_NON_LINE, STAT_NON_LINE.

Friction is excluded from the perimeter of use. The development still is the object of validation. The solver is only available on the waiter centralized for the moment (cf [9.1.16]).

1.3 Resorptions

1.3.1 **FACT_GRAD/FACT_LDLT** and **RESO_GRAD/RESO_LDLT**

Replaced by **TO_FACTORIZE** and **TO_SOLVE** (cf [9.1.14]).

1.4 Modified orders

1.4.1 **AFFE_CHAR_CINE**

EVOL_IMPO new:

- Allows to define the result of a preceding calculation as a kinematic loading. The application concerned is the structural zoom where one imposes on the border of the zoom the displacements obtained during the first calculation (cf [9.1.14]).

1.4.2 **AFFE_CHAR_MECA/AFFE_CHAR_MECA_F**

PRES_REP/CRACK new:

- Allows to apply a pressure to a crack nonwith a grid, defined by **DEFI_FISS_XFEM** (cf [9.1.8]).

CONTACT/GROUP_MA_FOND new:

- Jointly with the use of **METHODE='VERIF'**, this keyword makes it possible to define the bottom of crack on which it is useless to check the interpenetration (cf [9.1.11]).

LIAISON_SOLIDE/TRAN, ANGL_NAUT, CENTER new:

- These keywords make it possible to impose the displacement of an indeformable part of the model (cf [9.1.13]).

APPL_FORC_xxxx removed:

- These keywords were used for the loading **GRAPPE_FLUIDE** (cf [9.1.22]).

1.4.3 **AFFE_MATERIAU**

AFFE_VARC/FONC_INST new:

- This keyword was added in order to apply a loading, thermics for example from which the temporal evolution is different from that of mechanical calculation. For example, mechanical calculation can make cycle on a thermal evolution. The provided function then makes it possible to spend the time of the loading at the time of mechanical calculation (cf [9.1.5]).

TEMP_REF more value by default:

In order to eliminate the risk of false results with a bad taking into account of the temperature of reference, a calculation is regarded as thermomechanical if there exists a field of temperature on the element in question. In this case it is obligatory to inform at the same time the temperature of reference AND the thermal dilation coefficient. If one of these two values is absent, the code will stop in fatal error with a warning message for the user (cf [9.1.15]).

1.4.4 AFFE_MODELE

MODELING: GRILLE_EXCENTRE replace **GRID** :

- Taken into account of offsetting (cf [9.1.4]).

MODELING: xx_XFEM_CONT new:

- Finite elements `xx_XFEM` do not have any more a degree of freedom for the contact to deal with the problems without contact effectively. Finite elements `xx_XFEM_CONT` are added for that (cf [9.1.11]).

1.4.5 CALC_FONCTION

FRACTILE new:

- Calculation of the fractile of tablecloths or functions (cf [9.1.8]).

POWER/EXHIBITOR reality:

- It is from now on possible to take the real power of a function (cf [9.1.9]).

1.4.6 CALC_MATR_ELEM

MECA_GYRO new:

- Calculation of the gyroscopic matrix of damping for the calculation of lines of trees (cf [9.1.16]).

1.4.7 CALC_TABLE

VALE_xxx modified:

- In `IMPR_TABLE` and `CALC_TABLE`, it is possible to filter the lines of a table. By repeating the keyword `FILTER`, one applies one AND between the filters. One can now apply one OR by giving several values to the keywords `VALE_xxx` (cf [9.1.3]).

1.4.8 COMB_SISM_MODAL

MULTI_APPUI new:

- The taking into account of excitations correlated in multi-support allows. The user has the choice now enters `MONO_APPUI=' OUI '`, `MULTI_APPUI=' CORRELE '` (new option) or `'DECORRELE'` who corresponds to the option available before (cf [9.1.18]).

1.4.9 CREA_MAILLAGE

HEXA20_27 new:

- Allows to transform the elements `HEXA20` of a grid in elements `HEXA27` (cf [9.1.6]).

1.4.10CREA_RESU

OPERATION= ' ADZE ' new:

- Allows to possibly assemble several computation results thermal by relocating them. This operation can also be supplemented with `AFFE_MATERIAU/AFFE_VARC`, `FONC_INST` to repeat a thermal loading (cf [9.1.5]).

1.4.11 BEGINNING and CONTINUATION

RESERVE_CPU new value by default:

- This keyword makes it possible to hold a fraction of the total time of a study (asked in `astk`) at the end of the calculation for the tasks system (compression, recopy of file...). The value is fixed by default at 10% of the time required within a 900 seconds limit (cf [9.1.20]).

1.4.12DEFI_FONCTION

ORDERED X-COORDINATE/ new:

- Equivalent of the keywords `LIST_PARA` and `LIST_RESU` except that one passes from the lists of values instead of concepts `list_r8` (cf [9.1.9]).

1.4.13DEFI_LIST_ENTI

OPERATION = 'NUME_ORDRE' new:

- This makes it possible to extract the sequence numbers from a concept `result` in a given interval. One can then use this list in all the orders which accept the keyword `LIST_ORDRE` (cf [9.1.16]).

1.4.14DEFI_MATERIAU

RELATION_KIT/THM_DIFFU new:

- For the unsaturated models and the mixing rates `LIQU_XXX_GAZ`, the user can define his law while choosing is `HYDR_UTIL` like `front`, that is to say `HYDR_VGM`: law of Mualem Van-Genuchten. In this last case, it must define 5 parameters (cf [9.1.4]).

LETK new:

- It is about a viscoplastic law of Laigle and Klein to model the behavior of mudstone, rock host of a site of storage (cf [9.1.17]).

HUJEUX new parameters:

- It is the extension of the law of Hujeux into cyclic (cf [9.1.18]).

1.4.15DYNA_TRAN_MODAL

NB_MODE_DIAG removed:

- This keyword was not used (cf [9.1.11]).

1.4.16FORMULA

VALE_C new:

- Offer the possibility of defining a formula in complex value (cf [9.1.1]).

1.4.17IMPR_RESU

PART extended:

- Allows to select the real or imaginary part which will be printed (cf [9.1.2]).

GMSH/TYPE_CHAMP new:

- Allows to choose the type of field and the components to be printed with format GMSH: scalar (the defect), vectorial (`VECT_2D`, `VECT_3D`) or tensorial (`TENS_2D`, `TENS_3D`) (cf [9.1.10]).

1.4.18IMPR_TABLE

Cf. `CALC_TABLE` .

1.4.19LIRE_RESU

TYPE_RESU=' EVOL_VARC' new:

- Allows to read with format MED of the fields which will be then used as variables of orders: temperature, irradiation... (cf [9.1.17]).

COMP_INCR new:

- When a result is read, the keyword COMP_INCR allows to recreate information of the behavior which cannot be stored with format MED (cf [9.1.18]).

1.4.20 MACRO_MODE_MECA and NORM_MODE

MASS_INER removed:

- To facilitate the use of the order and to avoid the risks of errors, the mass is calculated by NORM_MODE (cf [9.1.18]).

1.4.21 MACR_CARA_POUTRE

GROUP_NO new:

- Even operation that the existing keyword NODE (cf [9.1.9]).

1.4.22 POST_CHAM_XFEM

NOM_CHAM extended:

- Possibility post-of treating the internal fields of variables (cf [9.1.4]).

1.4.23 POST_ELEM

MINMAX new:

- Allows to possibly extract the extrema from a component of a field in a table in the course of time. The table contains the localization (mesh or node) of the extrema (cf [9.1.18]).

1.4.24 POST_MAIL_XFEM

PREF_NGUD_X/M/P, PREF_MAILLE_X new:

- Allows to impose the prefix of the names of nodes created by the order (cf [9.1.5]).

1.4.25 POST_RCCM

NUME_PASSAGE removed:

- The use of NUME_PASSAGE is not possible any more for the type PIPING. In *Code_Aster*, one treats for the moment only the simple ways of passage (cf [9.1.22]).

1.4.26 TEST_FICHER (order developer)

NB_CHIFFRE, EPSILON removed, TYPE_TEST, NB_VALE, VALE new:

- See the documentation of the order (cf [9.1.21]).

1.4.27 THER_LINEAIRE, THER_NON_LINE, THER_NON_LINE_MO

Bringing together of syntax with STAT_NON_LINE (cf [9.1.19]):

- TEMP_INIT/NUMÉRIQUE_INIT becomes ETAT_INIT/NUMÉRIQUE_ORDRE.
- Under INCREMENT, NUME_INIT and NUME_FIN become NUME_INST_INIT and NUME_INST_FIN.

The recutting of the step of time is available and functions under the same conditions as STAT_NON_LINE (cf. SUBD_METHODE).

For THER_NON_LINE only, **OBSERVATION** is available with same syntax and same operation as in STAT_NON_LINE .

In THER_NON_LINE_MO , the only modification concerns ETAT_INIT/NUMÉRIQUE_ORDRE (because there is no list of step of time).

2 Innovations between 8.4 and 9.1

2.1 New orders

2.1.1 **DEFI_GEOM_FIBRE**

Within the framework of multifibre modelings of beam, this operator defines groups of fibre composing the section of the beams. One assigns then a material and a behavior to each group of fibre via `DEFI_COMPOR` (cf [9.0.10]).

2.1.2 **MACRO_EXPANS**

The goal of this macro-order is to make an expansion of experimental data on a digital model. For that, it connects the orders `PROJ_MESU_MODAL`, `REST_BASE_PHYS` and `PROJ_CHAMP` (cf [9.0.4]).

2.1.3 **MACRO_VISU_MEIDEE**

This macro-order takes again the features of tool `MEIDEE` developed by EDF R & D /MF2E which makes identification of fluid efforts. The macro-order is composed of a IHM with which the user interacts to adjust the correlation calculations/tests (cf [9.0.4]).

2.1.4 **OBSERVATION**

It is about an macro-order facilitating the projection of the results between the digital model and the experimental model by taking into account assumptions on the sensors (mono-axis for example), and by managing the changes of reference mark (cf [9.0.23]).

2.2 General modifications

2.2.1 Variables of order

The use of the temperature as variable of order in mechanics must now be done while using `AFFE_MATERIAU/AFFE_VARC/NOM_VARC=' TEMP '` instead of `AFFE_CHAR_MECA/TEMP_CALCULEE`.

2.2.2 Under-structuring

Homogenisation of vocabulary for the under-structuring: `MESH` is replaced by `SUPER_MAILLE` in `CALC_VECT_ELEM`, `DYNA_NON_LINE`, `STAT_NON_LINE` to be coherent with `DEFI_MAILLAGE`.

2.2.3 Keyword **SOLVEUR**

ELIM_LAGR2 new

- Within the framework of the use of solver MUMPS, this keyword allows to eliminate the 2^{ème} ddl of Lagrange. It is the new behavior by default (cf [9.0.2]).

REAC_RESI new

- For method FETI, this keyword determines the frequency of reactualization of the calculation of the residue of the GCPC of FETI (cf [9.0.17]).

2.2.4 Lobster version

The lobster version compatible with *Code_Aster* 9.1 is version 8.7.

2.3 Resorptions

2.3.1 DYNA_TRAN_EXPLI

The order DYNA_TRAN_EXPLI was reabsorbed. Explicit transitory calculation is available in DYNA_NON_LINE.

2.3.2 IMPR_CLASSI

The order made it possible to print the results of a modal analysis for code CLASSI.

2.4 Modified orders

2.4.1 AFFE_CARA_ELEM

AFFE_SECT, AFFE_FIBRE replaced by **MULTIFIBRE, GEOM_FIBRE** :

- These new keywords make it possible to affect groups of fibres (resulting from DEFI_GEOM_FIBRE starting from the grid of the section of the beam) to the elements of beam (cf [9.0.10]).

2.4.2 AFFE_CHAR_MECA/AFFE_CHAR_MECA_F

PRE_COND, COEF_RESI new

- Allow to choose the preconditionnor and his convergence criteria of the algorithm of the Gradient Combined Project of the contact, method GCP (cf [9.0.4]).

RECH_LINEAIRE new (experimental)

- This keyword has an effect on the manner of moving according to the direction of research: does one remain in convex working stresses or not? (cf [9.0.4]).

ALGO_CONT/ALGORITHME_FROT new

- Allows to choose (finely!) the formulation of the continuous method of contact/friction (Lagrangian, Lagrangian stabilized or Lagrangian increased) (cf [9.0.9]).

WEAR new

- Makes it possible to take an account a model of wear of surface slave of the type Archard (cf [9.0.9]).

MODL_AXIS removed

- Axisymmetric modeling is checked starting from the model and not this keyword (cf [9.0.17]).

CONTACT_XFEM/METHODE=' XFEM' new

- Definition of the contact on the lips of cracks (nonwith a grid) modelled with method XFEM. It should be noted that the contact SLIDE is now available with X-FEM (cf [9.0.21]).

2.4.3 AFFE_MATERIAU

AFFE_COMPOR new

- Allows to affect a behavior of beam multifibre (cf [9.0.10]).

NOM_VARC/LIST_NOM_VARC addition of 'TEMP'

- Addition of the temperature in variables of order under AFFE_VARC (cf [9.0.15]).

2.4.4 AFFE_MODELE

C_PLAN_XFEM, D_PLAN_XFEM replace **C_PLAN_X, D_PLAN_X**

- Homogenisation of the names of modelings (cf [9.0.11]).

3D_INCO_GD, AXIS_INCO_GD, D_PLAN_INCO_GD new modelings

- New quasi-incompressible modelings in great deformations (cf [9.0.11]).

3D_JOINT new modeling

- Extension to the 3D of the elements of joint and the law **CZM_EXP_REG** (cf [9.0.13]).

New modelings HH and HH2

- Hydraulic modelings unsaturated with type **HH** and **HH2** (cf. [9.0.26]).
Exhaustive list: **3D_HHS, 3D_HHD, 3D_HH2S, 3D_HH2D, AXIS_HHS, AXIS_HHD, AXIS_HH2S, AXIS_HH2D, D_PLAN_HHS, D_PLAN_HHD, D_PLAN_HH2S, D_PLAN_HH2D**

2.4.5 CALC_ELEM

ERRE_THM/LENGTH, PRESSURE, TEMPERATURE new

- Values characteristic allowing of adimensionner the calculation of the indicator of error in THM (cf [9.0.20]).

2.4.6 CALC_FONCTION

METHODE=' COMPLET' for the FFT

- Activate the algorithm accepting an unspecified number of samples for the calculation of the FFT (cf [9.0.9]).

2.4.7 CALC_NO

OPTION=' ARCO_NOEU_SIGM'

- Calculation of the constraints of arc and console (cf. [9.0.10]).

2.4.8 CREA_RESU

OPERATION=' PREP_VRC1' / 'PREP_VRC2'

- Allow to calculate the temperature in the layers of the multi-layer hulls, that is to say starting from a field of functions of time and space (**PREP_VRC1**), that is to say starting from a temperature calculated on a model hull containing **TEMP/TEMP_INF/TEMP_SUP** (cf. [9.0.15]).

2.4.9 BEGINNING and CONTINUATION

DYNAMICS new (experimental)

- The objects of a size higher than that specified are not allocated in the **jeveux** common, but dynamically in a zone independent memory. Experimental because the release of the memory is not managed yet ideally (cf [9.0.11]).

2.4.10DEFI_CABLE_BP

GRID removed

- The grid is recovered by the order from **MODEL** provided (cf [9.0.15]).

2.4.11DEFI_COMPOR

GEOM_FIBRE, MATER_SECT, MULTIFIBRE new

- Allow to define the behavior by group of fibres and material section to homogenize it. One can thus take into account several materials (one by group of fibres) on a multifibre element of beam (POU_D_EM, POU_D_TGM) (cf [9.0.10]).

2.4.12DEFI_FISS_XFEM

CONTACT removed

- The definition of the contact on the lips of the crack is done in AFFE_CHAR_MECA, keyword CONTACT, METHODE=' XFEM ' (cf [9.0.21]).

FORM_FISS new

- Allows to define simply the fissure shape, only elliptic for the moment, by giving some geometrical parameters (cf [9.0.23]).

2.4.13DEFI_FOND_FISS

NOEUD_EXTR, GROU_NO_EXTR replace MAILLE_ORIG, GROU_MA_ORIG

- Definition of the node of the bottom of crack (cf [9.0.12]).

2.4.14DEFI_MALLAGE

MACR_ELEM replace MACR_ELEM_STAT

- The static macronutrients and the dynamic macronutrients are now accepted (cf [9.0.13]).

2.4.15DEFI_MATERIAU

Becomes réentrant

- One can now enrich a material (for example, to add mechanical parameters to an initially thermal material). On the other hand, one cannot replace a behavior already present (cf [9.0.1]).

DIS_ECRO_LINE new

- Parameters for the viscoelastic law of behaviour with mixed work hardening on discrete elements (cf [9.0.3]).

DIS_VISC new

- Parameters for the law of type viscous shock absorber on the discrete elements (cf [9.0.3]).

HUJEUX new

- Parameters for law THM of Hujeux (cf [9.0.10]).

Behaviors ROUSS_PR, ROUSS_VISC : VISC_SINH_FO, BETA, DP_MAXI new

- Variation of the parameters according to a variable of order for the behaviors ROUSS_PR and ROUSS_VISC, plastic fraction of energy transformed into heat, threshold of plastic deformation with beyond which one starts the recutting of the step of time (cf [9.0.11]).

KOCKS_RAUCH new

- Parameters for the viscoplastic law of behavior of Kocks & Rauch for the monocrystal (cf [9.0.12]).

A_AMORC, B_AMORC, D_AMORC, R_AMORC new

- Coefficients necessary to the calculation of the factor of starting according to the RCCM (cf [9.0.16]).

ZETA_F, RG0, TOLER_ET, ZETA_G new

- Parameters for the integration of swelling and creep under irradiation for the law of behavior IRRAD3M (cf [9.0.20]).

NON_LOCAL/PENA_LAGR new

- Coefficient of penalization for the new algorithm concerning the models with gradient of internal variables (cf [9.0.23]).

ELAS_2NDG new

- Parameters of elasticity second gradient, modeling with gradient of voluminal deformation (cf [9.0.26]).

2.4.16 DYNA_NON_LINE and STAT_NON_LINE

SUIVI_DDL integrated into OBSERVATION

- The follow-up of a ddl is now proposed under the keyword factor OBSERVATION with SUIVI_DDL=' OUI ' (cf [9.0.10]).

FONCT_MULT new

- Introduction of a multiplying function of the loading of the macros-elements (cf [9.0.13]).

Only in DYNA_NON_LINE :

NEWMARK, TETA_METHODE, HHT removed. SCHEMA_TEMPS new

- With the fusion of DYNA_TRAN_EXPLI in DYNA_NON_LINE, a new keyword factor appears to define the diagram in time used and its parameters (cf [9.0.17]).

EXCIT_GENE, PROJ_MODAL new

- These two features result from DYNA_TRAN_EXPLI (cf [9.0.17]).

2.4.17 GENE_VARI_ALEA

COEF_VAR removed

- Useless keyword (cf [9.0.8]).

2.4.18 IMPR_MACR_ELEM

GROUP_MA_CONTROL new

- Specific meshes on which one can recover the evolution of the sizes after a calculation MISS3D (cf [9.0.15]).

FORMAT_R new

- Allows to choose the format of impression and thus the precision of the realities transmitted to ProMISS3D 1.4 (cf [9.0.28]).

2.4.19IMPR_RESU

INFO_MALLAGE only with format MED

- This keyword is active only with format MED (cf [9.0.22]).

2.4.20INFO_FONCTION

GRAVITY : more value by default

- In order to limit the risk of error, there is no more value by default because this one depends on dimensions of the problem (cf [9.0.28]).

2.4.21LIRE_RESU

CHAM_MATER, CARA_ELEM, EXCIT new

- One can optionally provide these keywords in order to build a complete result which one will be able in particular to treat in STANLEY (cf [9.0.10]).

2.4.22MACR_ELEM_DYNA

MATR_IMPE, CAS_CHARGE new

- Allow to create the loads on a macronutrient dynamic starting from generalized vectors (cf [9.0.13]).

2.4.23MACR_LIGN_COUPE

TYPE new, with the choices GROUP_NO, SEGMENT, ARC

- One introduces the possibility of making a statement of values on an arc of a circle (cf [9.0.12]).

Isofonctionnalité with POST_RELEVE_T (cf [9.0.22]):

- The extraction can be to make on one CHAM_GD.
- One can select the moments extracted the RÉSULT with the keywords NUMÉRIQUE/LISTE_ORDRE, INST/LISTE_INST...
- One can provide one GROUP_MA linear on which to make the statement of values,
- VIS_A_VIS is used for the option of the same name of PROJ_CHAMP.
- OPERATION=' EXTRACTION', 'AVERAGE'
- INVARIANT, ELEM_PRINCIPAUX...

2.4.24MACR_RECAL

INTERACTIVE GRAPH/ replaced by PILOT

- Allows to profit from all the possibilities of IMPR_FONCTION (cf [9.0.23]).

2.4.25MACR_SPECTRE

NORMALIZES : more value by default

- In order to limit the risk of error, there is no more value by default because this one depends on dimensions of the problem (cf [9.0.5]).

2.4.26MACRO_MISS_3D

Versions of ProMISS3D

- The version by default is version 1.3. Version 1.4 is authorized by the macro one (cf [9.0.28]).

2.4.27MEMO_NOM_SENSI

NOM_ZERO, NOM_UN removed

- Were not used (cf [9.0.23]).

2.4.28MODI_MODELE_XFEM

CONTACT new

- Allows to transmit the load of contact to model X-FEM (cf [9.0.21]).

2.4.29 POST_CHAM_XFEM

NOM_CHAM new

- Possibility of treating the stress fields 'SIEF_ELGA' (cf [9.0.20]).

MAILLAGE_SAIN, MAILLAGE_FISS, MODELE_VISU new

- To display results X-FEM, POST_MAIL_XFEM generate the fissured grid which should be provided behind MAILLAGE_FISS. The healthy grid is the initial grid. To visualize the fields at the points of Gauss, it is necessary as a preliminary to define a model only for visualization on the grid fissured to provide behind MODELE_VISU (cf [9.0.23]).

2.4.30 POST_K1_K2_K3

CRACK new

- Allows to calculate the stress intensity factors in postprocessing of a calculation X-FEM by interpolation of the jumps of displacement (cf [9.0.12]).

2.4.31 POST_MAIL_XFEM

MAILLAGE_SAIN new

- Initial grid into which it is necessary to introduce the crack (cf [9.0.23]).

2.4.32 POST_RCCM

TABL_SIGM_THETA new

- Table containing the constraints $\sigma_{\theta\theta}$ in order to calculate the factor of starting (cf [9.0.16]).

2.4.33 REST_BASE_PHYS

MACR_ELEM_DYNA new

- Allows to make the restitution in physical space on a macronutrient (cf [9.0.13]).

2.4.34 SIMU_POINT_MAT

FILING, MODELING, SIGM_IMPOSE, EPSI_IMPOSE new

- On calculation in a material point, these keywords make it possible to file only part of the results, to apply ways of loading in 2D, and to define the way of loading in constraints or deformations imposed (cf [9.0.5]).

COMP_ELAS, RECH_LINEAIRE, SIGM_INIT, EPSI_INIT, VARI_INIT new

- To allow to extend from use the nonlinear elastic behaviors, to activate linear research and to define an initial state not no one (cf [9.0.20]).

2.4.35 STAT_NON_LINE

See DYNA_NON_LINE.

Only in STAT_NON_LINE:

VARI_REFE new

- It is the value of reference for the internal variables used to estimate the convergence of the algorithm of Newton in the presence of RESI_REFE_REL (cf [9.0.23]).

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