

EDF-R&D/AMA
U4.0- Booklet: Use of the commands
Document: U4.01.05

Innovations and modifications of version 9

Abstract:

The object of this document is to give a comprehensive view of the modifications of syntax and new opportunities of the commands of Code_Aster occurred 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** of June 2007 and valid for **version 9.2** of 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 commands and the file `histor` of corresponding subversion (e.g.: [9.1.7], section *Support/Histor* of the www.code-aster.org site). The impacted commands are listed alphabetically.

1 Innovations between 9.1 and 9.2

1.1 New commands

1.1.1 CALCUL

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

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

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

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

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

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

Key word MATR_FACT of RESO_LDLT becomes MATR.

Key word MATR_ASSE of RESO_GRAD becomes MATR, and MATR_FACT becomes MATR_PREC.

1.2 General modifications

1.2.1 Command variables

the use of the temperature as command variable in mechanics must by means of be now made 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 reference temperature § AFFE_MATERIAU/TEMP_REF.

1.2.2 Behavior ELAS_VMIS_PUIS

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

Key word ELAS_VMIS_PUIS (analog of ELAS_VMIS_TRAC) appears in commands STAT_NON_LINE, DYNA_NON_LINE and CALC_G.

1.2.3 Parallel solver MUMPS distributed

This evolution consists in calling the MUMPS solver 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 distributed version, one distributes on the various processors the computation of the elementary matrixes, then the assembly and finally the resolution of the system. The mode of distribution is selected via key word PARALLELISME.

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 makes to the object of validation

the solver is only available on the server centralized for time (cf [9.1.16]).

1.3 Resorptions

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

Replaced by FACTORIZING and SOLVING (cf [9.1.14]).

1.4 Modified commands

1.4.1 **AFFE_CHAR_CINE**

EVOL_IMPO new:

- Allows to define result preceding computation as a kinematical loading. The application concerned is the structural zoom where one imposes on the border of the zoom displacements obtained during the first computation (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 the use of METHODE=' VERIF ', this key word allows to define the crack tip on which it is useless to check the interpenetration (cf [9.1.11]).

LIAISON_SOLIDE/TRAN, ANGL_NAUT, CENTER new:

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

APPL_FORC_xxxx removed:

- These key words were used for loading GRAPPE_FLUIDE (cf [9.1.22]).

1.4.3 **AFFE_MATERIAU**

AFFE_VARC/FONC_INST new:

- This key word was added in order to apply a loading, thermal for example from which the temporal evolution is different from that of mechanical computation. For example, mechanical computation 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 computation (cf [9.1.5]).

TEMP_REF more default value:

In order to eliminate the risk of results false with a bad taking into account of the reference temperature, a computation is regarded as thermomechanical if there exists a field of temperature on the element in question. In this case it is compulsory to inform at the same time the reference temperature AND the thermal coefficient of thermal expansion. 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

MODELISATION: GRILLE_EXCENTRE replaces GRILL :

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

MODELISATION: xx_XFEM_CONT new:

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

1.4.5 New

CALC_FONCTION FRACTILE:

- Computation of the fractile of three-dimensions functions or functions (cf [9.1.8]).

PUISSANCE/EXPOSANT reality:

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

1.4.6 New

CALC_MATR_ELEM MECA_GYRO:

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

1.4.7 Modified

CALC_TABLE VALE_XXX:

- In IMPR_TABLE and CALC_TABLE, it is possible to filter the lines of an array. By repeating factor key word the FILTRE, one applies one AND between the filters. One can now apply one OR by giving several values to the key words VALE_XXX (cf [9.1.3]).

1.4.8 New

COMB_SISM_MODAL MULTI_APPUI:

- The taking into account of excitations correlated out of multi-bearing allows. The user now has the choice between MONO_APPUI=' OUI ', MULTI_APPUI=' CORRELE ' (new option) or "DECORRELE" which correspond to the option available before (cf [9.1.18]).

1.4.9 CREA_MAILLAGE

HEXA20_27 new:

- Allows to transform elements HEXA20 of a mesh into elements HEXA27 (cf [9.1.6]).

1.4.10 New

CREA_RESU OPERATION= " ASSE ":

- Allows to possibly assemble several results of thermal computation 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 debut and POURSUITE

RESERVE_CPU news default value:

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

1.4.12DEFI_FONCTION

ABSCISSE/ORDERED new:

- Equivalent of key words `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 result concept in a given interval. One can then use this list in all the commands which accept key word LIST_ORDRE (cf [9.1.16]).

1.4.14New

DEFI_MATERIAU_RELATION_KIT/ THM_DIFFU:

- For the models unsaturated and the LIQU_xxx_GAZ coupling laws, the user can define his model by choosing either HYDR_UTIL like front, or HYDR_VGM : model of Mualem Van-Genuchten. In this last case, it must define 5 parameters (cf [9.1.4]).

LETK new:

- It is about a viscoplastic model 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 model of Hujeux in cyclic (cf [9.1.18]).

1.4.15Removed

DYNA_TRAN_MODAL_NB_MODE_DIAG:

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

1.4.16FORMULATE

VALE_C new:

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

1.4.17IMPR_RESU

PARTIE wide:

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

GMSH/new TYPE_CHAMP:

- Allows to choose the type of field and the component to print with format GMSH: scalar (the default), vectorial (VECT_2D, VECT_3D) or tensorial (TENS_2D, TENS_3D) (cf [9.1.10]).

1.4.18IMPR_TABLE

cf CALC_TABLE .

1.4.19New

LIRE_RESU TYPE_RESU=' EVOL_VARC':

- Allows to read at med format fields which will be then used as command variables: temperature, irradiation... (cf [9.1.17]).

COMP_INCR new:

- When one reads one result, key word COMP_INCR makes it possible to recreate information of the behavior which cannot be stored with med format (cf [9.1.18]).

1.4.20 MACRO_MODE_MECA and NORM_MODE

MASS_INER removed:

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

1.4.21New

MACR_CARA_POUTRE_GROUP_NO:

- Even operation that the existing key word NOEUD (cf [9.1.9]).

1.4.22Wide

POST_CHAM_XFEM NOM_CHAM:

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

1.4.23POST_ELEM

MINMAX new:

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

1.4.24POST_MAIL_XFEM

PREF_NOEUD_X/M/P, PREF_MAILLE_X new:

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

1.4.25Removed

POST_RCCM NUME_PASSAGE:

- The use of NUME_PASSAGE is not possible any more for the PIPEWORK type. In *Code_Aster*, one treats for time only the simple paths of transition (cf [9.1.22]).

1.4.26 TEST_FICHER (command developer)

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

- See documentation of the command (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 time step 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 relates to ETAT_INIT/NUMÉRIQUE_ORDRE (because there is no list of time step).

2 Innovations between 8.4 and 9.1

2.1 New commands

2.1.1 DEFI_GEOM_FIBRE

In the frame of the multifibre modelizations of beam, this operator defines groups of fiber composing the section of the beams. One assigns then a material and a behavior to each group of fiber via DEFI_COMPOR (cf [9.0.10]).

2.1.2 MACRO_EXPANS

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

2.1.3 MACRO_VISU_MEIDEE

This macro-command takes again the functionalities of tools MEIDEE developed by EDF R & D /MF2E which makes identification of fluid forces. The macro-command is composed of a GUI with which the user interacts to adjust the correlation computations/tests (cf [9.0.4]).

2.1.4 OBSERVATION

It acts of a macro-command facilitating the projection of the results between the model numerical and the model experimental in taking into account of the assumptions on the sensors (mono-axis for example), and by managing the changes of reference (cf [9.0.23]).

2.2 General modifications

2.2.1 Command variables

the use of the temperature as command variable in mechanics must by means of be now made AFFE_MATERIAU/AFFE_VARC/NOM_VARC=' TEMP' instead of AFFE_CHAR_MECA/TEMP_CALCULEE.

2.2.2 Substructuring

Homogenization of vocabulary for the substructuring: MESH is replaced by SUPER_MAILLE in CALC_VECT_ELEM, DYNA_NON_LINE, STAT_NON_LINE to be coherent with DEFI_MALLAGE.

2.2.3 New key word

solver ELIM_LAGR2

- In the frame of the use of the solver MUMPS, this key word makes it possible to eliminate the 2nd d.o.f. from Lagrange. It is the new behavior by default (cf [9.0.2]).

REAC_RESI new

- For method FETI, this key word determines the frequency of reactualization of the computation of the residue of the PCG of FETI (cf [9.0.17]).

2.2.4 Homard version

the homard version compatible with *Code_Aster* 9.1 is version 8.7.

2.3 Resorptions

2.3.1 DYNA_TRAN_EXPLI

command DYNA_TRAN_EXPLI was reabsorbed. The computation transitory clarifies is available in DYNA_NON_LINE.

2.3.2 IMPR_CLASSI

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

2.4 Modified commands

2.4.1 AFFE_CARA_ELEM

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

- These new key words make it possible to assign groups of fibers (resulting from **DEFI_GEOM_FIBRE** starting from the mesh of the section of the beam) to the beam elements (cf [9.0.10]).

2.4.2 AFFE_CHAR_MECA/AFFE_CHAR_MECA_F

PRE_COND, COEF_RESI new

- Make it possible to choose the preconditioner and its convergence criterion of the algorithm of the Conjugate gradient Project of the contact, method GCP (cf [9.0.4]).

RECH_LINEAIRE new (experimental)

- This key word has an effect on the way move according to the direction of search: does one remain in convex working stresses or not? (cf [9.0.4]).

New ALGO_CONT/ALGORITHME_FROT

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

USURE new

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

Removed MODL_AXIS

- The modelization axisymmetric is checked starting from the model and not this key word (cf [9.0.17]).

New CONTACT_XFEM/METHODE='XFEM'

- Definition of the contact on the crack lips (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

- Make it possible to affect a behavior of beam multifibre (cf [9.0.10]).

NOM_VARC/LIST_NOM_VARC addition of "TEMP"

- Addition of the temperature in command variables 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**

- Homogenization of the names of the modelizations (cf [9.0.11]).

3D_INCO_GD, AXIS_INCO_GD, D_PLAN_INCO_GD news modelizations

- New quasi-incompressible modelizations in large deformations (cf [9.0.11]).

3D_JOINT news modelization

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

New modelizations HH and hydraulic

- HH2 Modelizations 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/LONGUEUR, PRESSION, TEMPERATURE new

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

2.4.6 CALC_FONCTION

METHODE=' COMPLET' for the FFT

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

2.4.7 CALC_NO

OPTION=' ARCO_NOEU_SIGM'

- Computation of the stresses of arc and cantilever (cf [9.0.10]).

2.4.8 CREA_RESU

OPERATION=' PREP_VRC1'/'PREP_VRC2''

- Make it possible to calculate the temperature in the layers of the multi-layer shells, either from a field of functions of time and space (PREP_VRC1), or from a temperature calculated on a model shell containing TEMP/TEMP_INF/TEMP_SUP (cf [9.0.15]).

2.4.9 debuts and POURSUITE

DYNAMIQUE new (experimental)

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

2.4.10DEFI_CABLE_BP

MAILLAGE removed

- The mesh is recovered by the command starting from MODELE provided (cf [9.0.15]).

2.4.11DEFI_COMPOR

GEOM_FIBRE, MATER_SECT, MULTIFIBRE new

- Make it possible to define the behavior by group of fibers and the material section to homogenize it. One can thus take into account several materials (one by group of fibers) on a multifibre beam element (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 crack is done in AFFE_CHAR_MECA, key word CONTACT, METHODE=' XFEM' (cf [9.0.21]).

FORM_FISS new

- Makes it possible 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 crack tip (cf [9.0.12]).

2.4.14DEFI_MALLAGE

MACR_ELEM replaces MACR_ELEM_STAT

- One accepts the static macro-elements now and the dynamic macro-elements (cf [9.0.13]).

2.4.15DEFI_MATERIAU

Becomes reentrant

- 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]).

New DIS_ECRO_LINE

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

DIS_VISC new

- Parameters for the model of type viscous damper on the discrete elements (cf [9.0.3]).

HUJEUX new

- Parameters for model 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 command variable for behaviors ROUSS_PR and ROUSS_VISC, plastic fraction of energy transformed into heat, threshold of plastic strain with beyond which one starts the recutting of time step (cf [9.0.11]).

New KOCKS_RAUCH

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

A_AMORC, B_AMORC, D_AMORC, R_AMORC new

- Coefficients necessary to the computation 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 constitutive law IRRAD3M (cf [9.0.20]).

NON_LOCAL/PENA_LAGR new

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

ELAS_2NDG new

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

2.4.16 DYNA_NON_LINE and STAT_NON_LINE

SUIVI_DDL integrated into OBSERVATION

- the follow-up of a d.o.f. is now proposed under factor key word the OBSERVATION with SUIVI_DDL=' OUI ' (cf [9.0.10]).

New FONCT_MULT

- Introduction of a multiplying function of the loading of the macro-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, appears new factor key word to define the time scheme used and its parameters (cf [9.0.17]).

EXCIT_GENE, PROJ_MODAL new

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

2.4.17 GENE_VARI_ALEA

COEF_VAR removed

- useless Key word (cf [9.0.8]).

2.4.18 IMPR_MACR_ELEM

GROUP_MA_CONTROL new

- Meshes specific on which one can recover the evolution of the quantities after a computation MISS3D (cf [9.0.15]).

FORMAT_R new

- Makes it possible to choose the format of printing and thus the accuracy of the realities transmitted to ProMISS3D 1.4 (cf [9.0.28]).

2.4.19IMPR_RESU

INFO_MALLAGE only with med format

- the This key word is active only with med format (cf [9.0.22]).

2.4.20INFO_FONCTION

PESANTEUR : more value by default

- In order to limit the risk of error, it has there 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 key words in order to build result complete that one will be able to treat in particular in STANLEY (cf [9.0.10]).

2.4.22MACR_ELEM_DYNA

MATR_IMPE, CAS_CHARGE new

- Make it possible to create the loads on a macro-element dynamics from generalized vectors (cf [9.0.13]).

2.4.23New

MACR_LIGN_COUPE TYPE, with choices GROUP_NO, SEGMENT, ARC

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

Isofonctionnalité with POST_RELEVE_T (cf [9.0.22]):

- The extraction can be to make on a CHAM_GD.
- One can select the times extracted the RESULTAT with key words NUMÉRIQUE/LISTE_ORDRE, INST/LISTE_INST...
- One can provide a linear GROUP_MA on which to make the statement of values,
- VIS_A_VIS is used with the option of the same name as PROJ_CHAMP.
- OPERATION=' EXTRACTION', "AVERAGE"
- INVARIANT, ELEM_PRINCIPAUX...

2.4.24MACR_RECAL

GRAPHIQUE/INTERACTIF replaced by PILOTE

- Makes it possible 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, it has there 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

- Makes it possible to transmit the contact load to the model X-FEM (cf [9.0.21]).

2.4.29New

POST_CHAM_XFEM NOM_CHAM

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

MAILLAGE_SAIN, MAILLAGE_FISS, MODELE_VISU new

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

2.4.30POST_K1_K2_K3

FISSURES new

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

2.4.31POST_MAIL_XFEM

MAILLAGE_SAIN new

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

2.4.32New

POST_RCCM TABL_SIGM_THETA

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

2.4.33New

REST_BASE_PHYS MACR_ELEM_DYNA

- Makes it possible to make the restitution in physical space on a macro-element (cf [9.0.13]).

2.4.34SIMU_POINT_MAT

ARCHIVAGE, MODELISATION, SIGM_IMPOSE, EPSI_IMPOSE new

- On computation in a material point, these key words 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 stresses or strains 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 the linear search and to define a non-zero initial state (cf [9.0.20]).

2.4.35 STAT_NON_LINE

See DYNA_NON_LINE.

Only in STAT_NON_LINE:

VARI_REFE new

- It acts of the value of reference for the local variables used to estimate the convergence of the algorithm of Newton in the presence of RESI_REFE_RELA (cf [9.0.23]).

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