PLEXU02 – Checking of the command CALC_EUROPLEXUS in Summarized

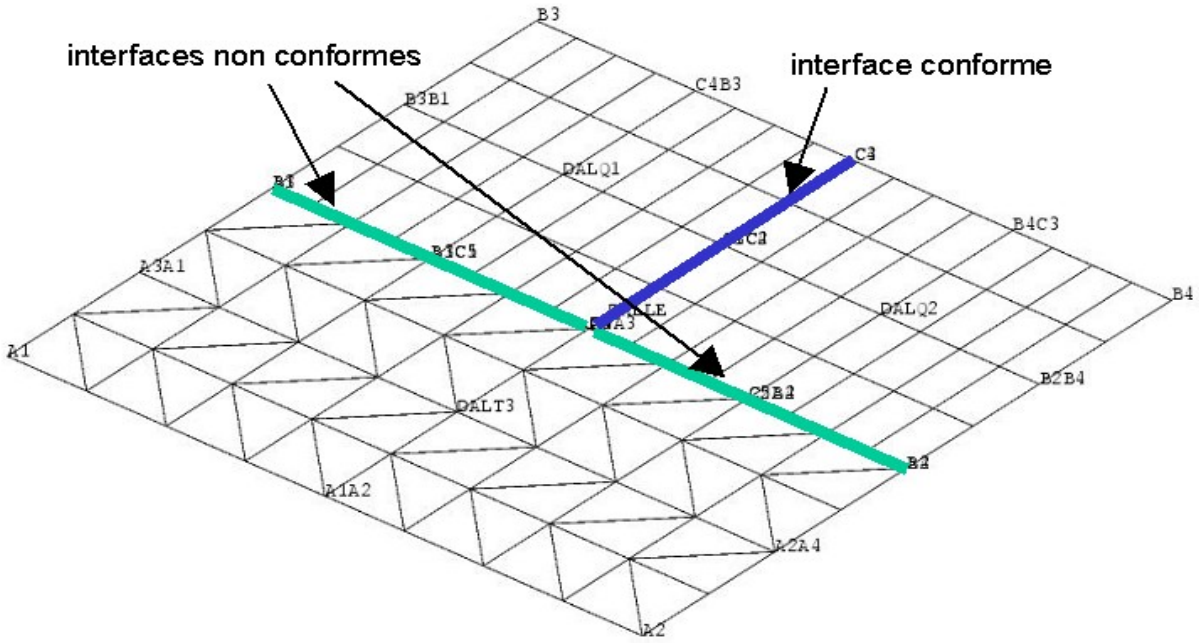
multi-field:

The purpose of this test is to check command CALC_EUROPLEXUS when it launches a computation EUROPLEXUS multi-field from a setting in data in Code_Aster and when the materials use model GLRC_DAMAGE . It is checked that the results recovered by Code_Aster following computation EUROPLEXUS are well those calculated by EUROPLEXUS only.

1 Problem of reference

1.1 Geometry

One considers a model structure in the form of a horizontal square slab having $1.3\,m$ of thickness and of $10\,m$ dimensioned, supported in four corners by springs. The mesh of slab contains three subdomains with a grid in triangles and quadrangles with three interfaces: an interface conforms (coincident nodes) between the subdomains $DALQ1$ and $DALQ2$ two interfaces nonin conformity between the subdomains $DALT3$ and $DALQ1$ $DALQ2$.



1.2 Properties of the material

the slab is out of reinforced concrete modelled via total model GLRC_DAMAGE.

1.3 Boundary conditions and loadings

the slab leans on four springs whose stiffness is specified. The slab is charged by a uniform surface pressure whose pace in time is given by a function.

1.4 Initial conditions

Nothing.

2 Reference solution

2.1 Méthode de calcul

the reference solution comes from computation EUROPLEXUS launched apart from Code_Aster.

2.2 Quantities and results of reference

One tests with final moment the values of vertical displacement to the node and stress and moment with Gauss points, read again by Code_Aster. One compares them with the values resulting from a computation EUROPLEXUS alone.

3 Modelization A

3.1 Characteristic of the modelization

One uses a modelization Q4GG for slab.

3.2 Characteristics of the mesh

The mesh of slab contains 64 elements of the type QUAD4 and 64 elements of the type TRIA3.

3.3 Accuracy on the materials

the materials used in this modelization do not take into account the nonlinear shears.

3.4 Quantities tested and results

One tests with final moment the values of vertical displacement, stress and moment, read again by Code_Aster. One compares them with the values resulting from a computation EUROPLEXUS alone.

Standard	identification of reference	Value of reference	Error
Not $PMMA$ - DZ	"NON_REGRESSION"	$-2.29653\mathrm{E}-06$	1.9E-4%
Nets $M12$ - MXX	"NON_REGRESSION"	$-1.0917\mathrm{E}+02$	3.1E-4%
Nets $M80$ - MYY	"NON_REGRESSION"	-223.91	1.1E-3%

4 Modelization B

4.1 Characteristic of the modelization

One use a modelization Q4GG for slab.

4.2 Characteristics of the mesh

The mesh of slab contains 64 elements of the type QUAD4 and 64 elements of the type TRIA3.

4.3 Accuracy on the materials

the materials used in this modelization take into account the nonlinear shears via factor key word the CISAIL_NL of operator DEFI_GLRC.

4.4 Quantities tested and results

One tests with final moment the values of vertical displacement, stress and moment, read again by Code_Aster. One compares them with the values resulting from a computation EUROPLEXUS alone.

Standard	identification of reference	Value of reference	Tolerance
Not *PMMA - DZ*	"NON_REGRESSION"	−2.134653E−06	0.1%
Mesh *M12 - MXX*	"NON_REGRESSION"	−108.58108	0.1%
Mesh *M80 - MYY*	"NON_REGRESSION"	−104.51	0.1%