PLEXU02 – Checking of the order CALC_EUROPLEXUS in multi-field

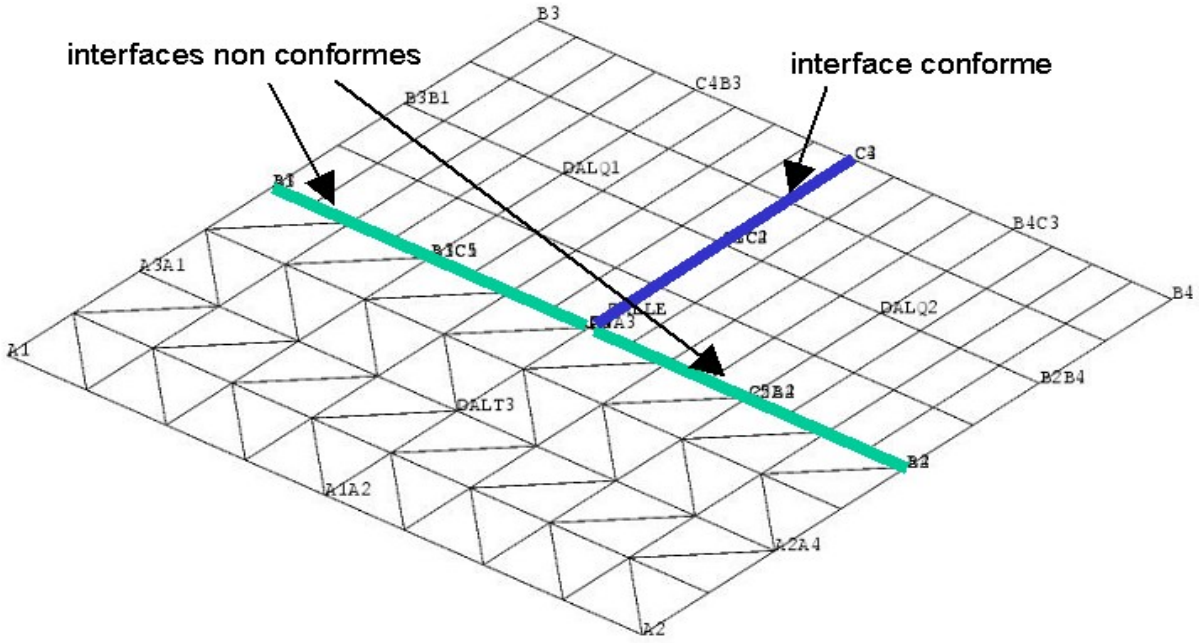
Summary:

The objective of this test is to check the order CALC_EUROPLEXUS when it launches a calculation EUROPLEXUS multi-field starting from a setting in data in Code_Aster and when the materials use the law GLRC_DAMAGE . It is checked that the results recovered by Code_Aster following calculation EUROPLEXUS are well those calculated by EUROPLEXUS alone.

1 Problem of reference

1.1 Geometry

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



1.2 Properties of material

The flagstone is out of reinforced concrete modelled via the total law GLRC_DAMAGE.

1.3 Boundary conditions and loadings

The flagstone is pressed on four springs whose stiffness is specified. The flagstone 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 Method of calculating

The reference solution comes from the calculation EUROPLEXUS launched apart from Code_Aster.

2.2 Sizes and results of reference

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

3 Modeling A

3.1 Characteristics of modeling

A modeling is used Q4GG for the flagstone.

3.2 Characteristics of the grid

The grid of the flagstone contains 64 elements of the type QUAD4 and 64 elements of the type TRIA3.

3.3 Precision on materials

The materials used in this modeling do not take into account nonlinear shearing.

3.4 Sizes tested and results

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

Identification	Type of reference	Value of reference	Error
Not $PMMA$ - DZ	'NON_REGRESSION'	$-2.29653\mathrm{E}-06$	0.1%
Mesh $M12$ - MXX	'NON_REGRESSION'	-30.74955	0.1%
Mesh $M80$ - MYY	'NON_REGRESSION'	-63.06798333333334	0.1%

4 Modeling B

4.1 Characteristics of modeling

A modeling is used Q4GG for the flagstone.

4.2 Characteristics of the grid

The grid of the flagstone contains 64 elements of the type QUAD4 and 64 elements of the type TRIA3.

4.3 Precision on materials

The materials used in this modeling take into account nonlinear shearing via the keyword factor CISAIL_NL of the operator DEFI_GLRC.

4.4 Sizes tested and results

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

Identification	Type of reference	Value of reference	Tolerance
Not $PMMA$ - DZ	'NON_REGRESSION'	$-2.134653\mathrm{E}-06$	0.1%
Mesh $M12$ - MXX	'NON_REGRESSION'	-30.810940325403333	0.1%
Mesh $M80$ - MYY	'NON_REGRESSION'	-29.811387977106666	0.1%