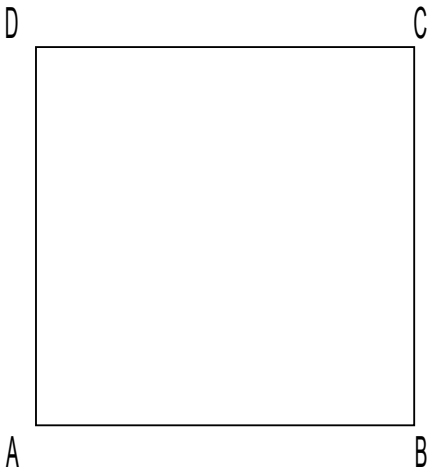
ZZZZ229 - Validation of the command AFFE_CHAR_MECA/LIAISON_SOLIDE + TRAN + ANGL_NAUT

Summarized:

This problem tests the got results, by the application of a translation and a rotation, with operator AFFE_CHAR_MECA/LIAISON_SOLIDE.

1 Problem of reference

1.1 Geometry



the square is in space $[0.,1.]\times[0.,1.]$.

Coordinates of the points (m) :

$A:(0.,0.)$
$B:(1.,0.)$
$C:(1.,1.)$
$D:(0.,1.)$

1.2 Properties of the material

- $E=1.0\ E5\ N/m^2$
- $\nu=0.3$
- $\rho=9800.\ kg.m^{-3}$

1.3 Boundary conditions and loadings

- imposed Displacements:
  - Rotation of $90°$ around point: D
  - $ABCD$ $DX=-1\ m$ and $DY=1\ m$

2 Quantities and

2.1 result Reference solution of reference

the variable reference used are selonetdu displacements X Y not C.

Analytical solution:

- Rotation of $90°$ around point: D $C(1,1) \rightarrow C(0,2)$
- Translation of (- 1,1): $C(0,2) \rightarrow C(-1,3)$

One from of deduced displacements from reference to point: C

- $DX = -2\,m$
- $DY = 2\,m$

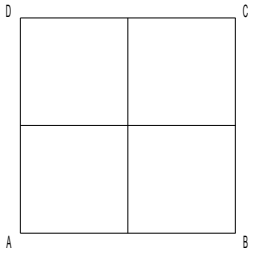
3 Modelization A

3.1 Characteristic of the modelization A

Modelization D_PLAN :

Many nodes 9
Number of meshes 12 Are:

SEG2 8
QUAD4 4



3.2 Results

Points	Quantity	Reference	Tolerance (%)
C	DX	-2.0	0.100
	DY	2.0	0.100

4 Summary of the results

This benchmark shows the correct operation of operator AFFE_CHAR_MECA used with key word LIAISON_SOLIDE in the case of a rotation and a translation.

Note:

If rotation is null, one can make the same thing with DDL_IMPO.

If rotation is strong, the “solid” is really not deformed but the stresses are not forcing null (assumption of the small transformations by default).