

MUMPS02 - Validation of solver MUMPS for a model DPLAN_INCO_UPG

Summary:

This case test makes it possible to validate solver MUMPS during the use of finite elements adapted to the treatment of the incompressible problems. Various values of the keyword PARALLELISM are tested.

1 Problem of reference

1.1 Geometry



Coordinates of the points (m) :

- $A:(0.,0.,0.)$
- $B:(100.,0.,0.)$
- $C:(100.,50.,0.)$
- $D:(0.,50.,0.)$

A rectangular plate length 100m and width 50m.

1.2 Material properties

- $E=1.0 E2 N / m^2$
- $\nu=0.4999$

1.3 Boundary conditions

$DX = 1, DY=2$ on all the grid

2 Solution

2.1 Sizes and results of reference

The reference variable used is displacement according to the axis X and according to the axis there with the node C.

Displacement at the point C: $DX = 1$, $DY = 2$

3 Modeling A

3.1 Characteristics of modeling

A modeling is used D_PLAN_INCO_UPG.

3.2 Characteristics of the grid

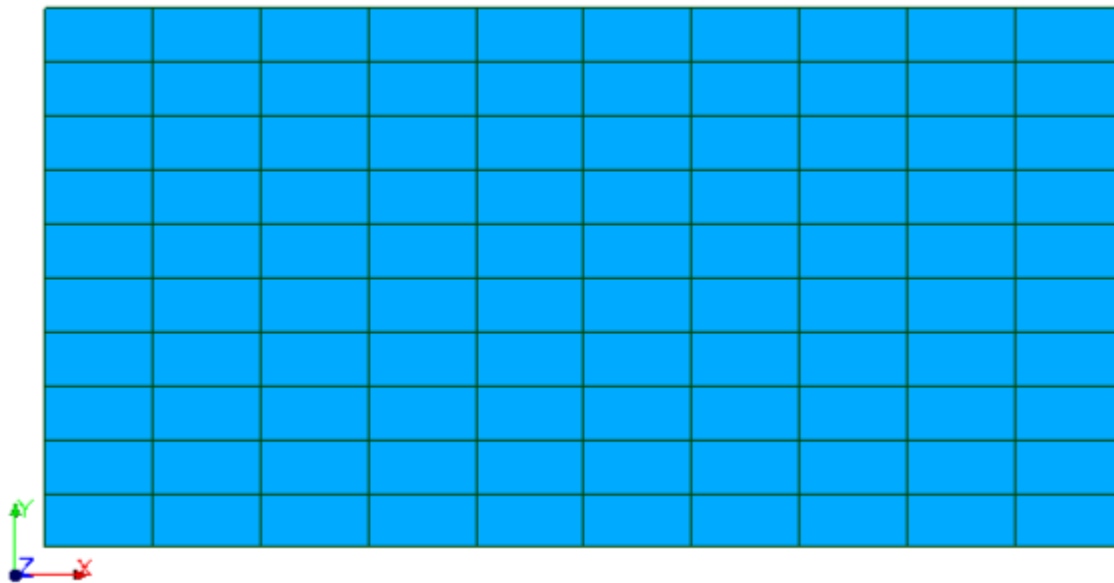
Many nodes: 341

Many meshes: 140

That is to say:

SEG3 40

QUAD8 100



3.3 Configurations of solver tested

- MUMPS (centralizes) + SYMGEN + PCENT_PIVOT=20 + RESI_RELA=1.E-8
- MUMPS (centralizes) + SYMGEN + RESI_RELA=1.E-4
- MUMPS (centralizes) + MIXER_PRECISION=' OUI'
- MUMPS (centralizes) + FILTRAGE_MATRICE=1.E-8
- MUMPS (distributed by meshes) + SYMGEN + RESI_RELA=1.E-8
- MUMPS (distributed by under-fields) + SYMGEN + RESI_RELA=1.E-8
- MUMPS (distributed by under-fields with distributed matrix) + SYMGEN + RESI_RELA=1.E-8

4 Modeling B

4.1 Characteristics of modeling

Modeling B is identical to modeling A but it is launched in parallel.

5 Summary of the results

This CAS-test shows the good performance of the solver MUMPS in the various studied cases.