

MUMPS03 - Validation of solver MUMPS for the complex matrices

Summary:

This CAS-test makes it possible to validate solver MUMPS during the use of complex matrices for modeling of an acoustic phenomenon with orders burst while modulating:

- the taking into account of boundary conditions of Dirichlet,
- the use of various renumérateurs.

1 Problem of reference

1.1 Geometry

It is about one parallelepiped of length $1.m$ according to x , of width $0.2m$ according to z and of depth $0.1m$ according to y .

1.2 Material properties

- $\rho = 1.3 \text{ Kg}/m^3$
- $c = 343. + 0. j m/s$

1.3 Boundary conditions

The speed imposed on the group 'ENTRY' is $0.014 + 2. j m/s$.
Impedance imposed on the group 'EXIT' is $445.9 + 3. j N s/m$.
Pressure imposed on the node 'NO600' is $1. + 3. j N/m^2$.
Pressure imposed on the node 'NO500' is $1. + 3. j N/m^2$.

2 Solution

2.1 Sizes and results of reference

The reference variable used is the pressure calculated with the node 'NO1'.

3 Modeling A

3.1 Characteristics of modeling

A modeling is used 3D.

Many nodes 471

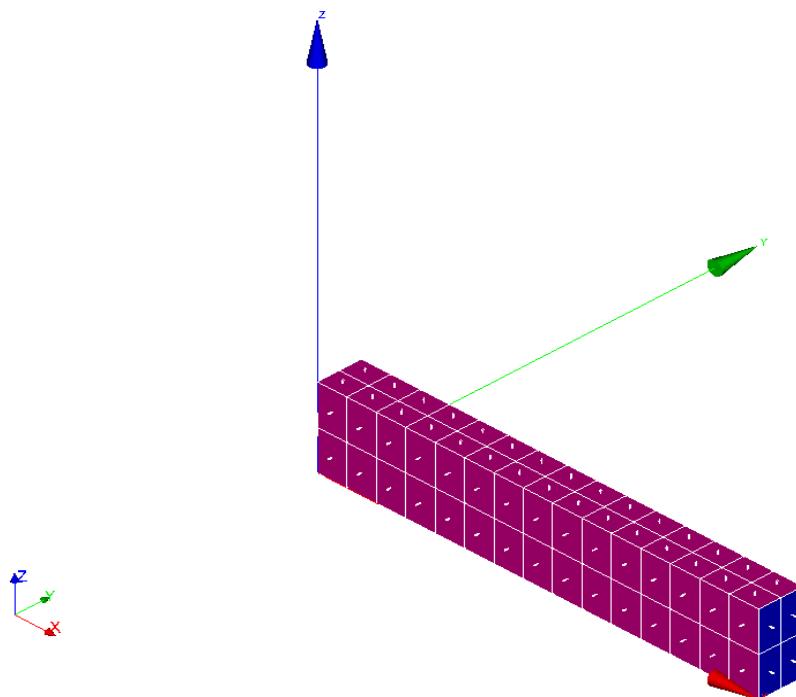
Many meshes 68

Shears: QUAD8

8

HEXA20

60



3.2 Configurations of solver tested

- MULT_FRONT **without** TANK MOVIES
- MUMPS **without** TANK MOVIES + ASSEMBLY + MONGREL
- MULT_FRONT **with** TANK MOVIES
- MUMPS **with** TANK MOVIES + ASSEMBLY + AMD + RESI_RELA=1.E-10
- MUMPS **with** TANK MOVIES + ASSEMBLY + MFA
- MUMPS **with** TANK MOVIES + ASSEMBLY + SCOTCH TAPE
- MUMPS **with** TANK MOVIES + ASSEMBLY + PORD
- MUMPS **with** TANK MOVIES + ASSEMBLY + MONGREL +
ACCELERATION=' AUTO'/'FR'/'FR+'/'LR'/'LR+'

4 Summary of the results

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