
SDLV402 - Substructuring dynamics: incompatible mesh and Summarized

mode:

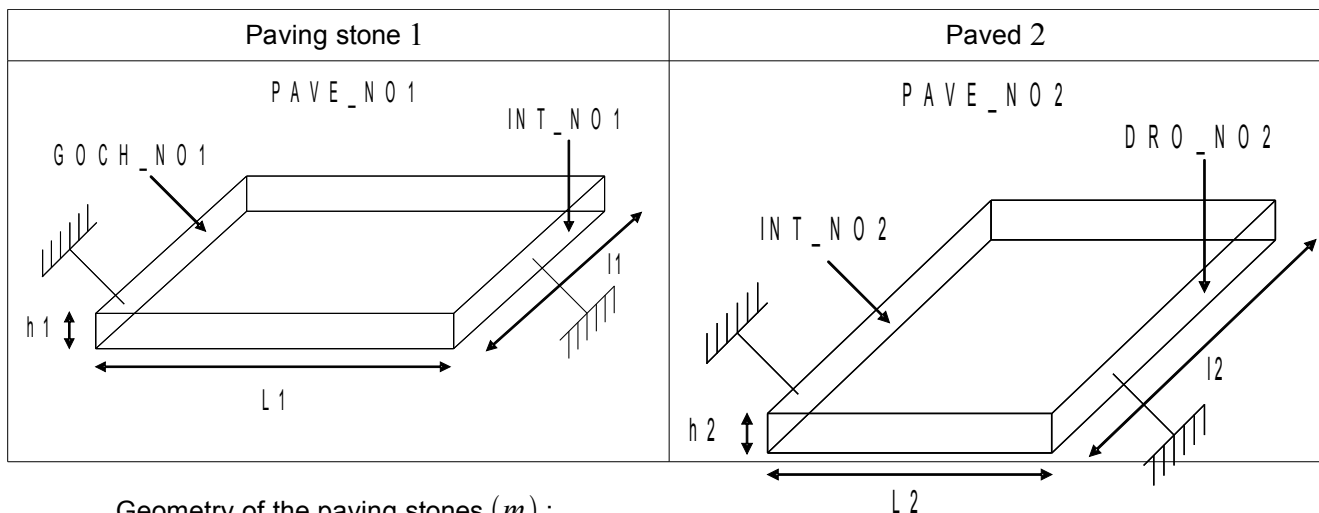
The purpose of this case test is to calculate the eigenfrequencies of two coupled paving stones. Accordingly, the features of incompatibility of mesh in substructuring dynamics are tested, as well as the coupling by mode of interface.

The case test is composed of a modelization 3D , of each paving stone.

1 Problem of reference

1.1 Geometry

Geometry of substructures:



Geometry of the paving stones (m) :

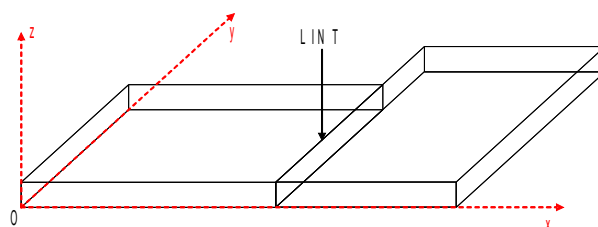
$L1=1$	$L2=0.5$
$l1=0.5$	$l2=0.7$
$h1=0.2$	$h2=0.2$

Mesh group:

PAVE_NO1 : together meshes of the paving stone 1
GOCH_NO1 : together meshes forming the face of left of the paving stone 1
INT_NO1 : together meshes forming the face of right of the paving stone 1

PAVE_NO2 : together meshes of the paving stone 2
INT_NO2 : together meshes forming the face of left of the paving stone 2
DRO_NO2 : together meshes forming the face of right of the paving stone 2

Geometry of structure:



Mesh group:

LINT : interface formed by the mesh groups *INT_NO1* and *INT_NO2*

1.2 elastic Properties of the materials

- Paved 1 :
 - $E = 7.1E10 Pa$ Modulus Young
 - $\nu = 0.3$ Poisson's ratio
 - $\rho = 2700.0 kg.m^{-3}$ Density
- Paved 2 :
 - $E = 12.0E10 Pa$ Modulus Young
 - $\nu = 0.3$ Poisson's ratio
 - $\rho = 7820.0 kg.m^{-3}$ Density

1.3 Boundary conditions and loadings

- paved imposed Displacement 1 :
 - $GOCH_NO1$ and INT_NO1 : $DX = DY = DZ = 0.0$
- Paved imposed displacement 2 :
 - DRO_NO2 and INT_NO2 : $DX = DY = DZ = 0.0$
- Interface paving stone 1 :
 - INT_NO1 : Interface of type *CRAIGB*
- Interfaces paved 2 :
 - INT_NO2 : Interface of Reference solution *CRAIGB*

2 type

2.1 Computation of reference

One uses a reference `AUTRE_ASTER` to test the frequencies.

Course of the case test:

- Definition and computation of the static modal base of each paving stone from their model
- Creation of one modele generalized static by coupling of the bases and models of the paving stones
- Computation and restitution of the modes of interface on the paving stones
- Definition and computation of the modal base of each paving stone by including the modes interfaces
- Creation of one modele generalized by coupling of the bases and models of the paving stones
- Computation of the Restitution
- eigen modes on the basis of and the result physical base

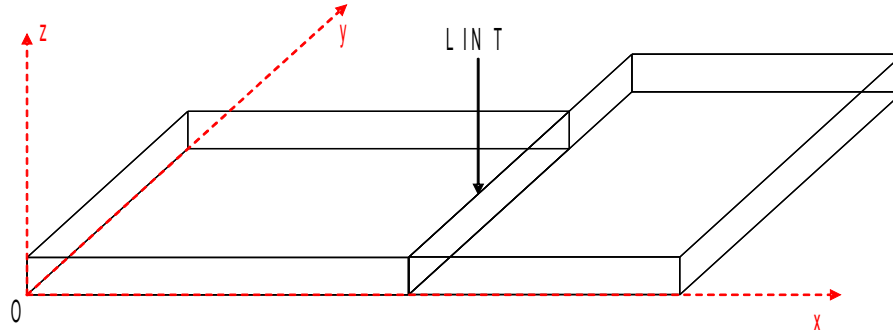
2.2 Quantities eigen mode of reference

- `FREQ` : component

frequency	N° mode	Reference (Hz)
<i>FREQ</i>	1	430.852
	2	707.717
	3	808.549
	4	930.199
	5	1193.94

3 Modelization A

3.1 Characteristic of the modelization



Modelization pavé3D 1 :

Many nodes	515		
Number of meshes	100	Are:	
		QUAD8	20
		HEXA20	80

Modelization pavé3D 2 :

Many nodes	620		
Number of meshes	120	Are:	
		QUAD8	20
		HEXA20	100

3.2 Quantities tested and results

Component	N° mode	Reference (Hz)	Tolerance (%)
<i>FREQ</i>	1	430.852	1.0
	2	707.717	1.0
	3	808.549	1.0
	4	930.199	4.0
	5	1193.94	5.0

4 Summary of the results

the got results are satisfactory.