

## PERF006 – Dynamic substructuring: thin plate leaned on its edges

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### Summarized:

The purpose of this benchmark is to measure the performances of the dynamic substructuring.

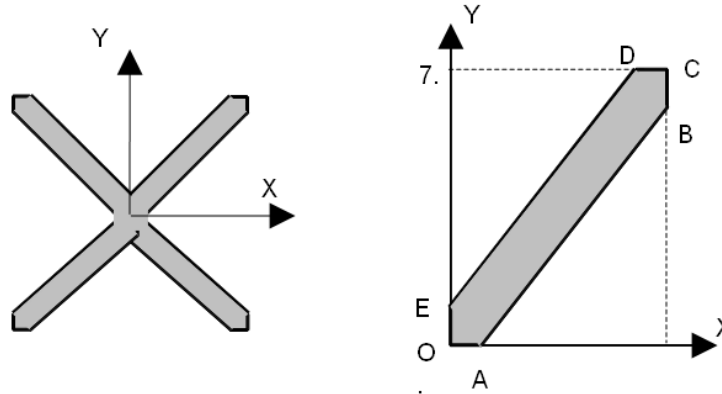
The two modelizations *DKT* carried out are the following ones:

- Modelization a: mesh `TRIA3`,  $1.3 E5$  degrees of freedom.
- Modelization b: mesh `TRIA3`,  $2.75 E5$  Problem

## 1 degrees of freedom of reference

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### 1.1 Geometry



Thickness = 0,1 m

$$OA=OE=BC=CD=1 m$$

### 1.2 Properties of the material

- $E=2.1 E11 Pa$
- $\nu=0.3$
- $\rho=7800 kg.m^{-3}$

### 1.3 Boundary conditions and loadings

- imposed Displacements:
  - $OA : DX = DY = DZ = DRX = DRY = DRZ = 0$
  - $OE : DY = DY = DZ = DRX = DRY = DRZ = 0$
  - $BC : DX = DY = DZ = 0$
  - $CD : DX = DY = DZ = 0$

## 2 Reference solution

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### 2.1 Method of calculating

result of reference (Eigen frequency) was obtained by making the average of frequencies calculated during the modelizations  $A$  and  $B$  on the structure total, by means of the dynamic substructuring.

### 2.2 Results of reference

Frequency = 8.28 Hz

### 2.3 Uncertainties

numerical Solution

## 3 Modelization A

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### 3.1 Characteristic of the modelization A

Modelization *DKT* :

Many nodes	22214		
Number of meshes	44816	Are:	
		SEG2	1170
		TRIA3	43646

### 3.2 Results

Quantity	Reference (Hz)	Tolerance (%)
<i>FREQ</i> n°5	8.28	5.00E-2

## 4 Modelization B

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### 4.1 Characteristic of the modelization B

Modelization *DKT* :

Many nodes	45 807		
Number of meshes	92 172	Are:	
		SEG2	1 680
		TRIA3	90 492

### 4.2 Results

Quantity	Reference (Hz)	Tolerance (%)
<i>FREQ</i> n°5	8.28	5.00E-2

## 5 Summary of the results

Machine	Aster	MOD.	Nb DDL	Memory (Mo)		Time execution ( DEFI_BASE_MODAL ) (dry)			
				Allocated	Used	USERS	SYSTEM	USERS+SYS	ELAPSED
Linux 64 bits (ia64) "Bull"	10.1	A	134.010. 349		319	166.72	2.27	168.99	169.07
		B	275.928	1148	219	598.60	5.75	604.35	604.96