

PERF006 – dynamic Under-structuring: thin section pressed on its edges

Summary:

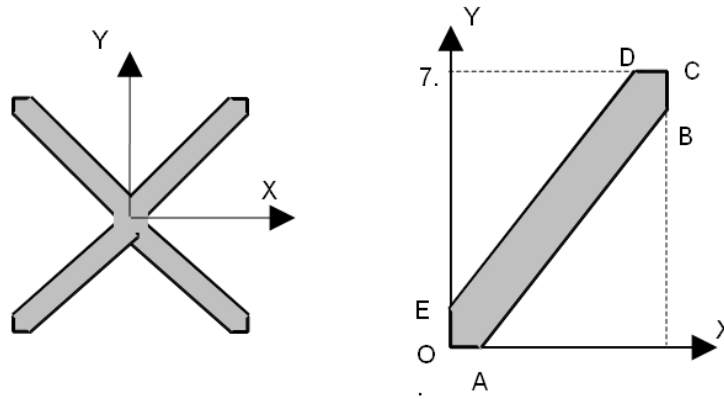
The objective of this CAS-test is to measure the performances of the dynamic under-structuring.

Two modelings *DKT* carried out are the following ones:

- Modeling a: grid TRIA3, $1.35 E5$ degrees of freedom .
- Modeling b: grid TRIA3, $2.72 E5$ degrees of freedom

1 Problem of reference

1.1 Geometry



Thickness = 0,1 m

$$OA = OE = BC = CD = 1 \text{ m}$$

1.2 Properties of material

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

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

2.1 Method of calculating

The result of reference (Eigen frequency) was got by making the average of frequencies calculated at the time of modelings A and B on the total structure, by using the dynamic under-structuring.

2.2 Results of reference

Frequency = 8.28 Hz

2.3 Uncertainties

Digital solution

3 Modeling A

3.1 Characteristics of modeling A

Modeling *DKT* :

Many nodes	22 487	
Many meshes	45 362	That is to say:
		SEG2 1 170
		TRIA3 44 192

3.2 Results

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

4 Modeling B

4.1 Characteristics of modeling B

Modeling *DKT* :

Many nodes	45 413	
Many meshes	91 384	That is to say:
		SEG2 1 680
		TRIA3 89 704

4.2 Results

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

5 Summary of the results

5.1 Results with Code_Aster 10.1

Machine	Aster	MOD.	Nb DDL	Memory (Mo)		Time execution (DEFI_BASE_MODELE) (dryness)			
				Allocated	Used	USERS	SYSTEM	USERS+SYS	ELAPSED
Linux 64 bits (ia64) "Bull"	10.1	With	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

5.2 Results with Code_Aster 12.2.5

Machine	Aster	MO D.	Nb DDL	Time execution (DEFI_BASE_MODELE) (dryness)			
				USERS	SYSTEM	USERS+SYS	ELAPSED
Linux 64 bits "Aster5"	12.2.5	With	134,922	24.25	0.37	24.62	24.67
		B	272,478	96.03	1.08	97.11	97.26

Machine	Aster	MO D.	Nb DDL	Consumption Memory (DEFI_BASE_MODELE) (Mo)			
				VmPeak	VmSize	Optimum	Minimum
Linux 64 bits "Aster5"	12.2.5	With	134,922	1020.40	782.57	762.04	108.88
		B	272,478	2074.34	1545.2	1814.48	212.77