

## SSNV175 - Test of the method of delocalization per regularization of the deformation GRAD\_EPSI on a bar variable 3D of section in traction with the law of behavior ENDO\_ORTH\_BETON

---

### Summary:

One presents a test of uniaxial traction on a variable bar of section with the law of behavior ENDO\_ORTH\_BETON, in the case of the nonlocal model by regularization of the deformation.

## 1 Problem of reference

---

### 1.1 Geometry and boundary conditions

One considers a bar with variable section length  $100\text{ m}$ , thickness  $1\text{ m}$ , of greater section  $10\text{ m}$  and of smaller section  $1\text{ m}$ .

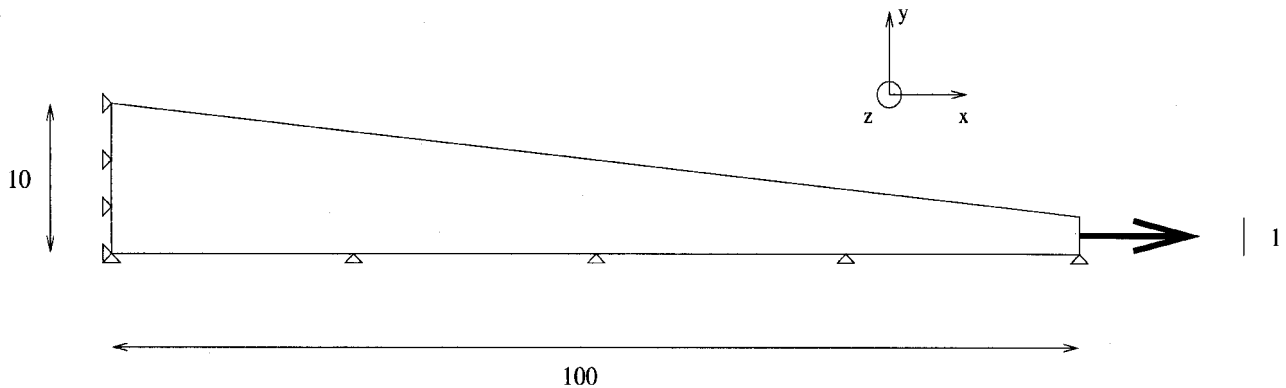


Figure 1.1-a: Geometry and boundary conditions of the uniaxial tests

### 1.2 Properties of materials

Elastic behavior:

$$E = 32000 \text{ MPa} ; \nu = 0.2$$

Length characteristic of the delocalization:  $\sqrt{3}\text{ m}$

## 2 Reference solution

---

This test is a test of nonregression.

## 3 Modeling A

---

### 3.1 Parameters of the model/Characteristic of material

```
ENDO_ORTH_BETON: ALPHA = 0.87,  
                  K0 = 3.e-4,  
                  K1 = 10.5,  
                  K2 = 6.e-4,  
                  ECROB=1.e-3,  
                  ECROD=0.06
```

### 3.2 Characteristics of modeling

Modeling 3D\_GRAD\_EPSI

Element MGCA\_TETRA10

### 3.3 Characteristics of the grid

Many nodes: 507  
Many meshes and types: 54 TRIA6  
174 TETRA10

### 3.4 Features tested

The law of behavior ENDO\_FRAGILE  
Type of piloting: PRED\_ELAS

### 3.5 Results of modeling A

Moment	Name of the field	Component	Place	Aster
51	DEPL	<i>DX</i>	<i>N2</i>	2.47389E-03
51	VARI_ELGA	<i>VI</i>	<i>M169</i> , point 2	6.73271E-01

## 4 Summary of the results

---

This CAS-test makes it possible to ensure to it not regression of the nonlocal version 3D\_GRAD\_EPSI law of behavior ENDO\_ORTH\_BETON.