SSNV211 - Triaxial compression test drained with the model VISC_DRUC_PRAG

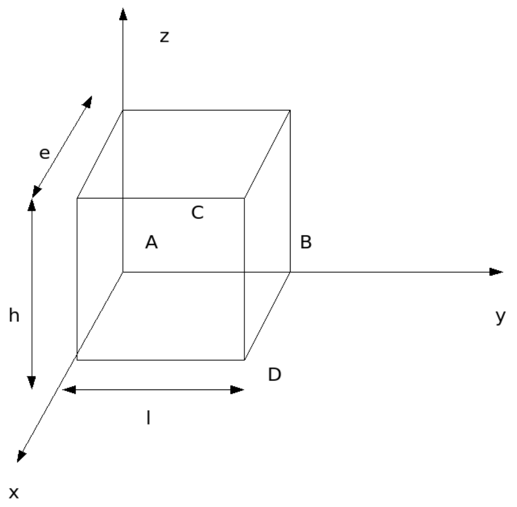
Summarized

This test makes it possible to validate VISC_DRUC_PRAG the model based on the model élastoplastiqe Drucker-Prager. creep is taken into account by a model power of the Perzyna type. It is about a triaxial compression test in pure mechanics or drained condition. Computations are carried out only on the solid part of the soil without hydraulic coupling. One applies a level of containment of $5\,MPa$. By reason of symmetry, one is interested only in the eighth of a sample subjected to a triaxial compression test. The modelization is axisymmetric.

It is about a test of non regression.

1 Problem of reference

1.1 Geometry



height: $h=1\,m$
width: $l=1\,m$
thickness: $e=1\,m$

Coordinates of the points (in meters):

	A	B	C	D
x	0.	0.	0.5	1.
y	0.	1.	0.5	1.
z	0.	0.	0.5	0.

1.2 Material property

elastic properties under key word ELAS:

$E=5000.0$ in MPa
$\nu=0.12$
$\alpha=0.0$

viscoplastic properties under word VISC_DRUC_PRAG:

$P_{ref}=0.1$ in MPa
$A=1.5.10^{-12}$ of s^{-1}
$n=4.5$
$p_{pic}=0.015$
$p_{ult}=0.028$
$\alpha_0=0.065$
$\alpha_{pic}=0.26$
$\alpha_{ult}=0.091$
$R_0=1.3021$ MPa
$R_{pic}=6.24808$ of MPa
$R_{ult}=1.30808$ Mpa
$\beta_0=-0.15$
$\beta_{pic}=0.$
$\beta_{ult}=0.13$

1.3 Initial conditions, boundary conditions, and loading

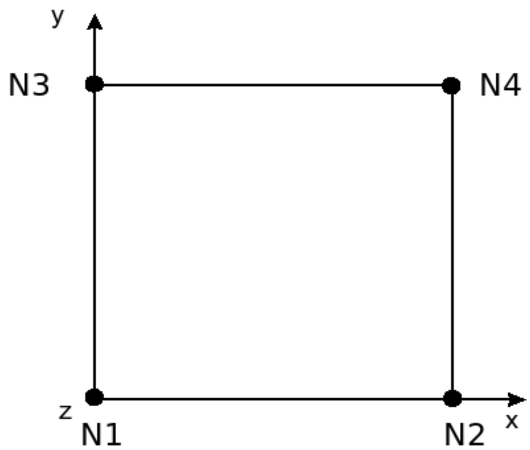
Phase 1:
One brings the sample in a homogeneous state: $\sigma_{xx}^0=\sigma_{yy}^0=\sigma_{zz}^0$, by imposing the corresponding confining pressure on the front, side right and higher sides. Displacements are blocked on the sides postpones ($u_x=0$), side left ($u_y=0$) and lower ($u_z=0$).

Phase 2:
One maintains displacements blocked on the sides postpones ($u_x=0$), side left ($u_y=0$) and lower ($u_z=0$), as well as the confining pressure on the front sides and side right. One applies a displacement imposed to the upper face: $u_z(t)$, in order to obtain a strain $\varepsilon_{zz}=-6$.

2 Modelization A

2.1 Characteristic of the modelization

`2D_Axi` :



Cutting: 1 in height, 1 in width.

Loading of phase 1:
Confining pressure: $\sigma_{xx}^{0}=\sigma_{zz}^{0}=-5\,MPa$

2.2 Characteristic of the mesh

Many nodes: 4
Number of meshes and types: 1 `QUAD4` and 4 `SEG2`

2.3 Quantities tested and results

For $\sigma_{xx}^{0}=\sigma_{zz}^{0}=-5\,MPa$

Localization	**Time**	**Forced (** MPa **)**	***Aster***
Point $N4$	7000.	σ_{yy}	– 5.000
	13000.	σ_{yy}	– 11.667

Localization	**Time**	**Aster**	***Displacement***
Point $N4$	7000.	DX	-7.6 10-4
	13000.	DX	3.4598 10-2

3 Summary of the results

It acts of a test of non regression developed to validate VISC_DRUC_PRAG `in` pure mechanics the model.