ZZZZ325 – CALC_CHAMP / `SIRO_ELEM`

Summary:

This test validates the programming utilized by the functionality:
  • CALC_CHAMP / CONSTRAINT = `SIRO_ELEM`

Modeling a:
  Hexahedrons
1 Principle of the test

In this test, one imposes on all the edge of the model a linear displacement according to the coordinates. The deformation is then homogeneous in all the structure (and known in advance). The material being elastic with a null Poisson’s ratio, the tensor of constraints is worth:

```
#  SIXX    SIYY    SIZZ   SIXY  SIXZ    SIYZ
#  1.E+02  2.E+02  1E+03  0.    5.E+01  1.E+02
```

One can then easily calculate the various components of the field SIRO_ELEM on facets whose normals are respectively the vectors \((0.,0.,1.)\) and \((0.,0.,-1.)\):

Normal \((0.,0.,1.)\)

```
#  SIG_NX      0.
#  SIG_NY      0.
#  SIG_NZ      1.E+03
#  SIG_N       1.E+03
#  SIG_TX      5.E+01
#  SIG_TY      1.E+02
#  SIG_TZ      0.
#  SIG_T1X     -1.E+02
#  SIG_T1Y     0.
#  SIG_T1Z     0.
#  SIG_T1      1.E+02
#  SIG_T2X     0.
#  SIG_T2Y     -2.E+02
#  SIG_T2Z     0.
#  SIG_T2      2.E+02
```

Normal \((0.,0.,-1.)\)

```
#  SIG_NX      0.
#  SIG_NY      0.
#  SIG_NZ     -1.E+03
#  SIG_N       1.E+03
#  SIG_TX     -5.E+01
#  SIG_TY     -1.E+02
#  SIG_TZ      0.
#  SIG_T1X    -1.E+02
#  SIG_T1Y     0.
#  SIG_T1Z     0.
#  SIG_T1      1.E+02
#  SIG_T2X     0.
#  SIG_T2Y     2.E+02
#  SIG_T2Z     0.
#  SIG_T2      2.E+02
```

2 Validation

In this test, one checks the 15 components above. The results are precise \((1.e^{-8}\) into relative and \((1.e^{-3}\) in absolute for the theoretically worthless components).

Note:

The test validates the two following cases:
- an “external” facet (skin);
- an “internal” facet wedged between two voluminal elements.