

ZZZZ325 – CALC_CHAMP / "SIRO_ELEM"

Summarized:

This test validates the programming used by the functionality:

- CALC_CHAMP / FORCED = "SIRO_ELEM"

Modelization a:

Hexahedrons

1 Principle of the test

In this test, one imposes on all edge of the model a linear displacement according to the coordinates. The strain is then homogeneous in all structure (and known in advance). The material being elastic with a null Poisson's ratio, the stress tensor 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 field `SIRO_ELEM` on a facet whose norm is the vector $(0., 0., 1.)$:

```
# 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 $1.e-3$ absolute for the theoretically null components).

Note: the test validates the two following cases:

- an "external" facet (skin).
- An "internal" facet wedged between 2 voluminal elements.