

The FORTRAN 90 code **BEMHomogenization** has been developed to solve the numerical examples presented in [1]. It is a general-purpose boundary element software for two-dimensional analyses. In the code, linear (constant) shape functions for the displacements (tractions) at the boundary are assumed, and the material has been taken to be linear elastic.

To run the executable, an input file is needed, which must be supplied just after the start of the program (note that the input file should be located in the same directory containing the program executable). As an example, we provide the two input files:

node_tens.txt

and

node_compr.txt

both corresponding to the solution of the problem presented in Sect. 2.3. In `node_tens.txt` the unilateral model is used (section 2.2.1), while `node_compr.txt` the layered model is used (section 2.2.2)

A directory named **Result**, should also be created within the directory where the executable is located. All the output files will be saved in that folder.

The output files (located in the directory `Result`) are:

- 1) **geom.txt** file, where the data regarding the initial geometry of the problem are reported;
- 2) **spost.txt** file, where the results are reported in terms of boundary displacement, tractions and internal fields.
- 3) **homog.txt** file, where the results are reported in terms of homogenized elastic constants.

We provide three commented examples of the above files for information, namely

Geom_compr.txt

Spost_compr.txt

Homog_compr.txt

REFERENCES

[1] Katia Bertoldi, Davide Bigoni, Walter J. Drugan. "Nacre: an orthotropic and bimodular elastic material". *Composites Science and Technology*, 2007, in Press.