

Static structural analysis using an existing hexahedral mesh – Stent expansion

Assuming that the hexahedral mesh of the stent is generated using an alternative meshing tool, the purpose of this example is to demonstrate usage of the `dfemtoolz` for applying BCs to an existing hexahedral mesh. Briefly, we assume that one needs to simulate expansion-deployment of the stent by applying the uniform pressure to the stents' inner surfaces.

Algorithm

Input:

List of nodes and hexahedral elements that define the stent mesh (in the `.sli` format).

Input:

List of the stent mesh faces (quadrilaterals) where pressure should be applied (in the facet list - `.fal` plain text format).

Output:

`.sli` (simple list) file, which contains the generated model (list of nodes and elements) and BCs (for each node and the list of faces where pressure is prescribed); and posfiles of user preference for visualisation (surface with applied pressure, elements, nodes...).

1

Call the `dfemtoolz_nolimit` module to recognize outer surface of the given model.

2

for `i=1` to to number of `.fal` files (1) that contains surfaces on which loads should be applied do

3

Set a type of load (force, pressure) for the `i`-th load surface.
(this was done, and `.cfg` files are configured in `input/` directory)

4

Call the `dfemtoolz_openR` module to prescribe the given BCs to the model.

5

end for

In `output/` directory user can find the results. Output files can be different if user modify settings in `.cfg` files.

Final results are in `final-output.zip` package as well.