Setting the problem:
The Salome Platform file ‘half_coil.hdf’ is used to generate the meshes, Partition_1 for the full coil and Partition_3 for the half coil. See the parameters for the meshes and a preview in this guide below.

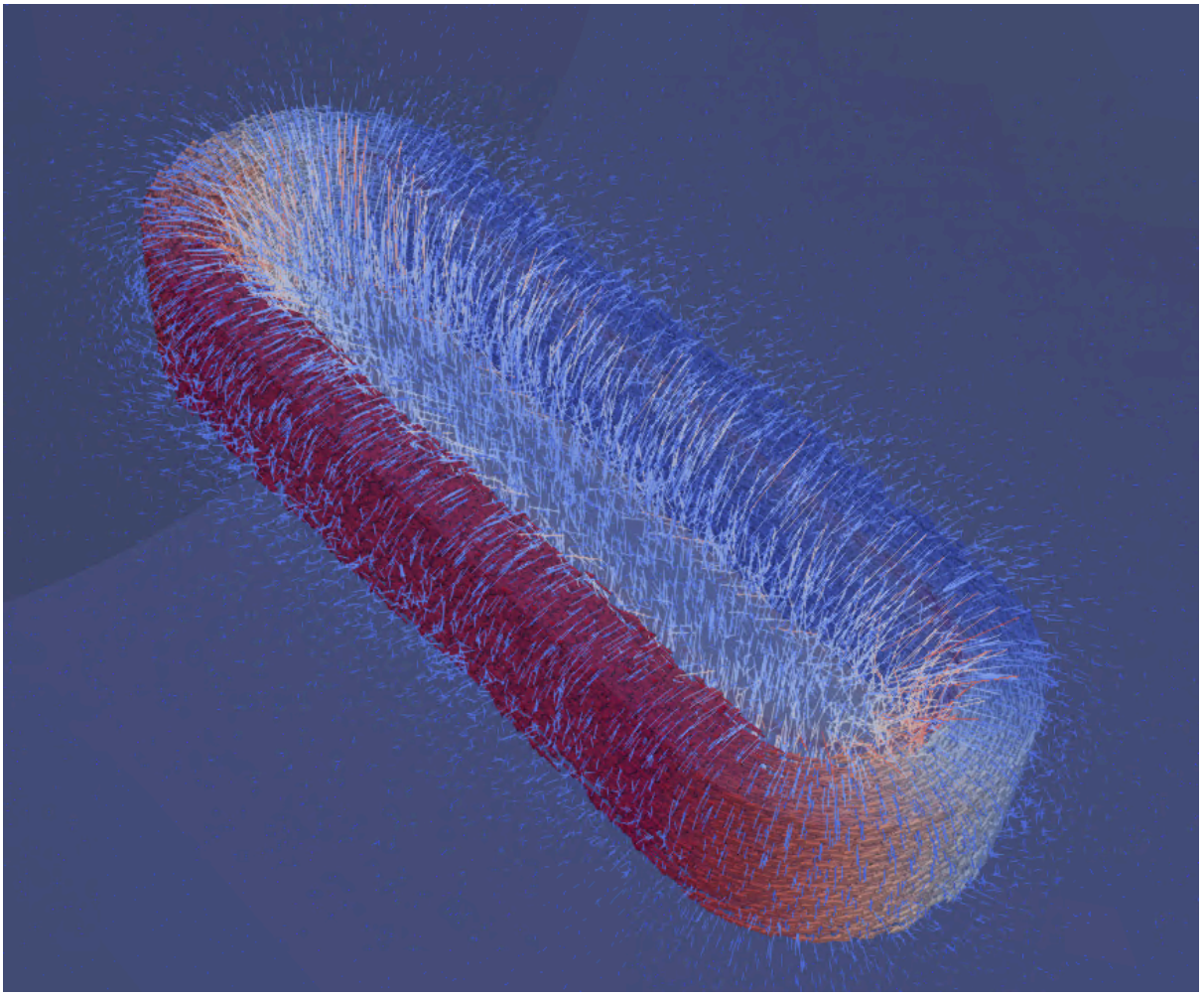
I am simulating in Windows, and my files are organised as follows:

CAD	CAD - contains the Salome file
closed_coil	Folder closed_coil - full coil case
mesh	Folder mesh for closed coil
res_cl_nc	Folder res_cl_nc is the result folder without circuit
res_cl_std	Folder res_cl_std is the result folder for stranded case
femm	Folder femm with FEMM files
open_wpot	Folder open_coil - half coil case
mesh	Folder mesh for half coil
res_wp_ms	Folder res_wp_ms is the result folder for massive case
res_wp_std	Folder res_wp_std is the result folder for stranded case

This is set this way to help get the plots with the plot_res.ipynb Python script.

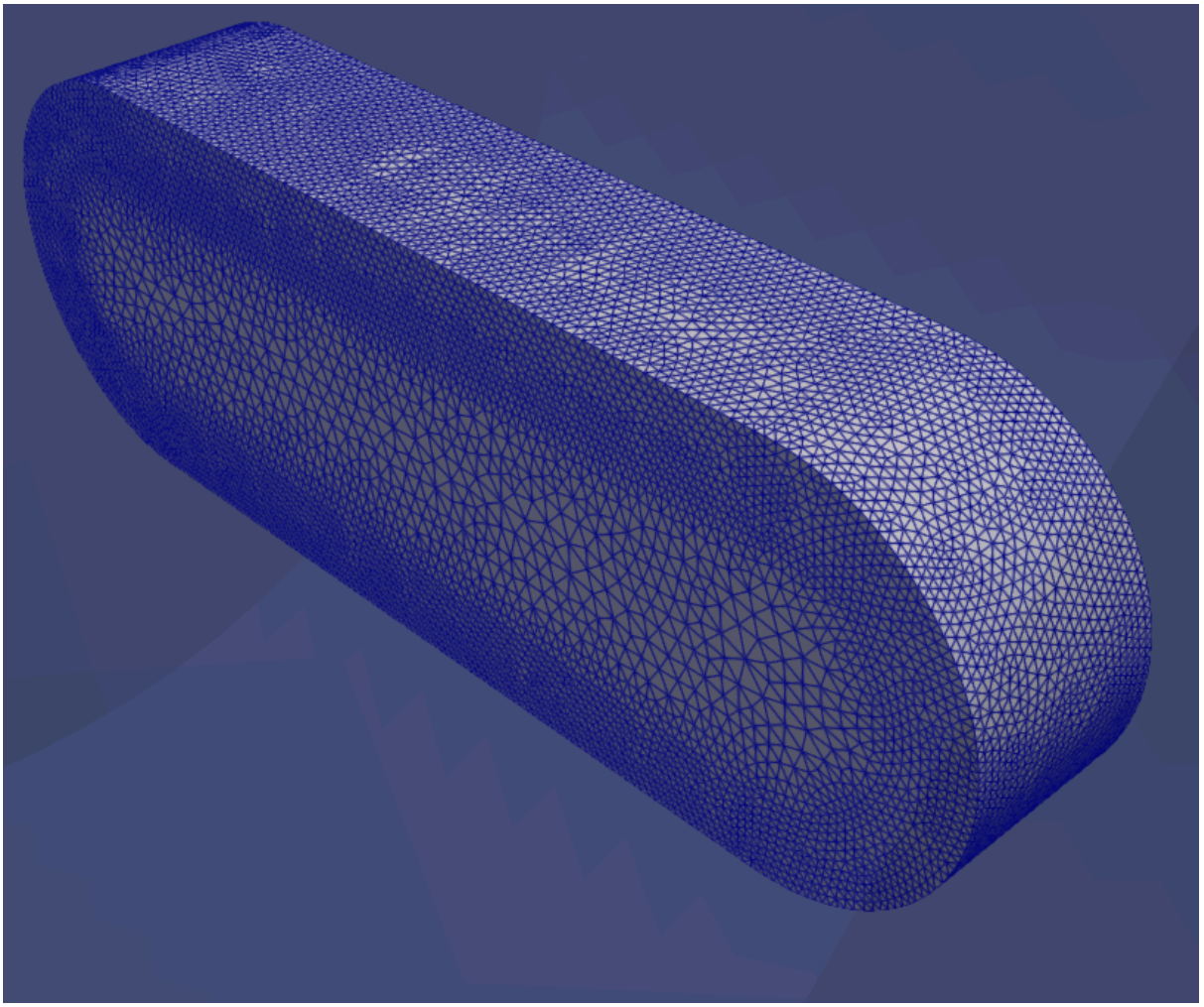
CoilSolver evaluation.

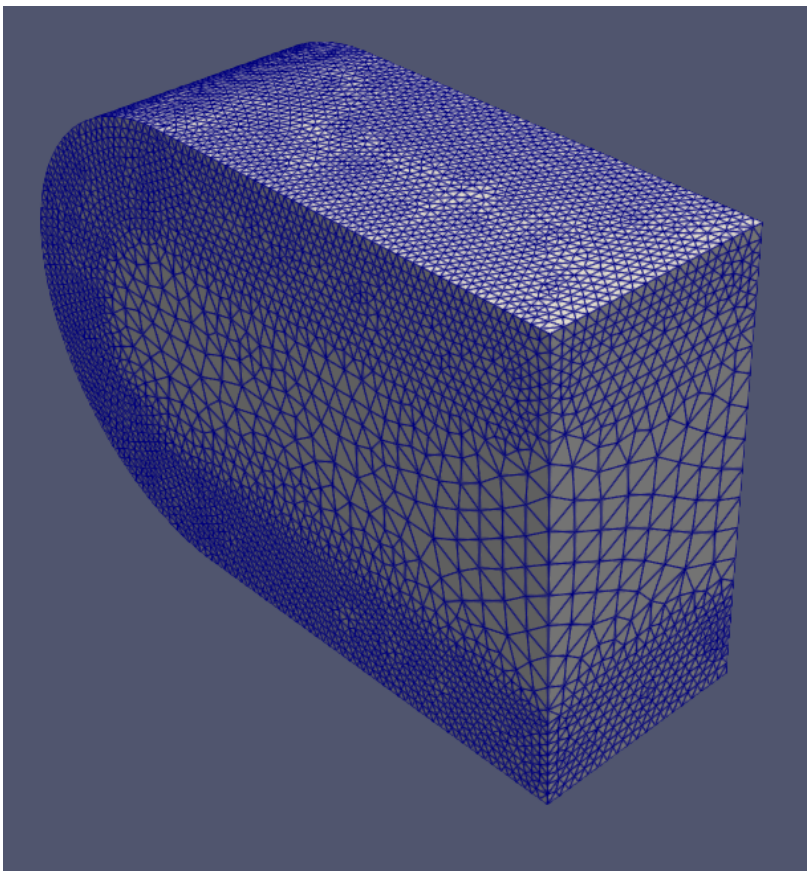
So, now, we have two models to be compared against each other and to FEMM. The same coil with an inner core and a bounding cylinder.

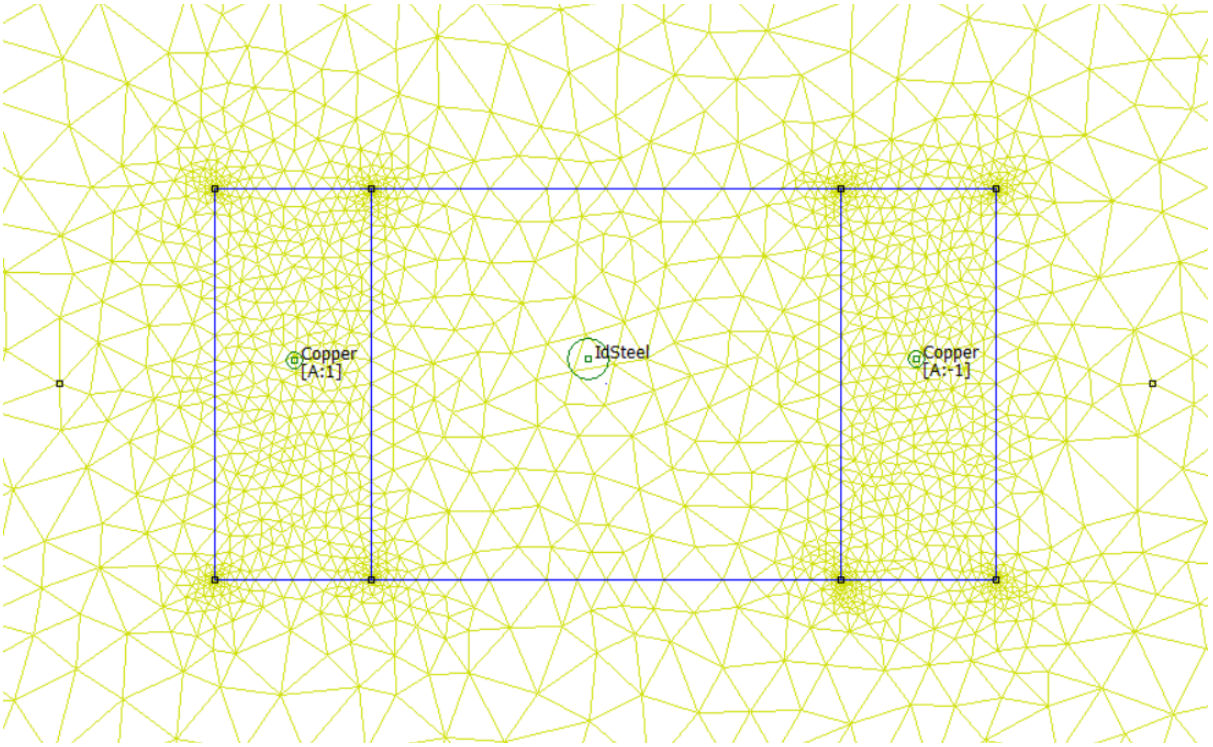


The models are:

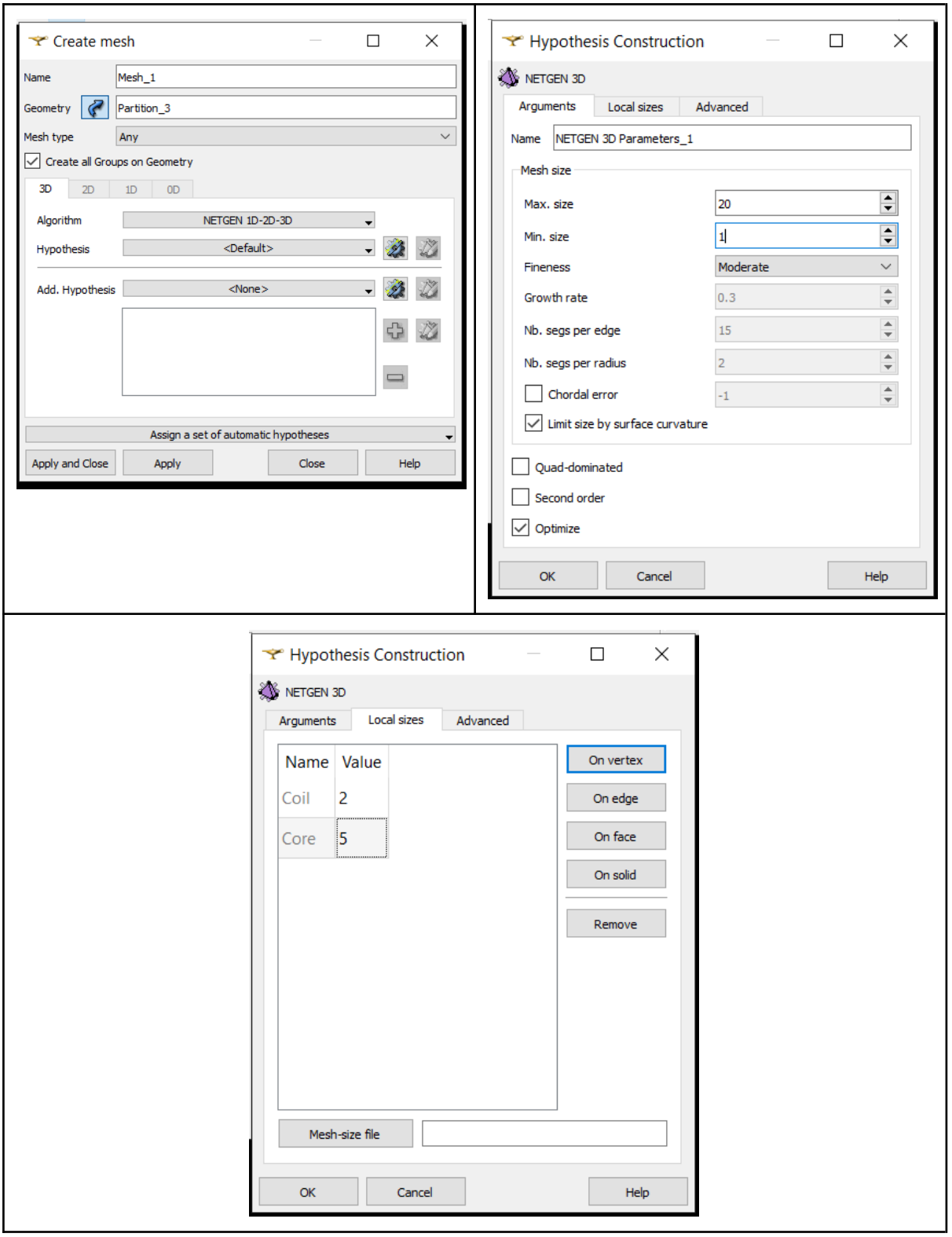
- Full coil using CoilSolver
- Half coil using WPotential Solver
- FEMM



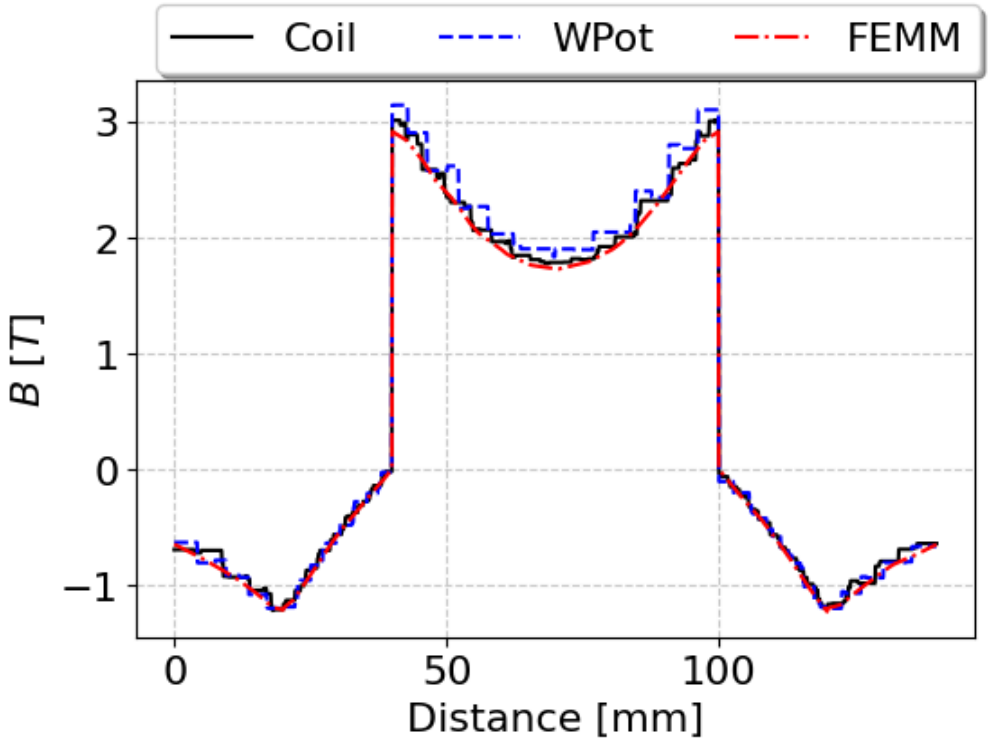




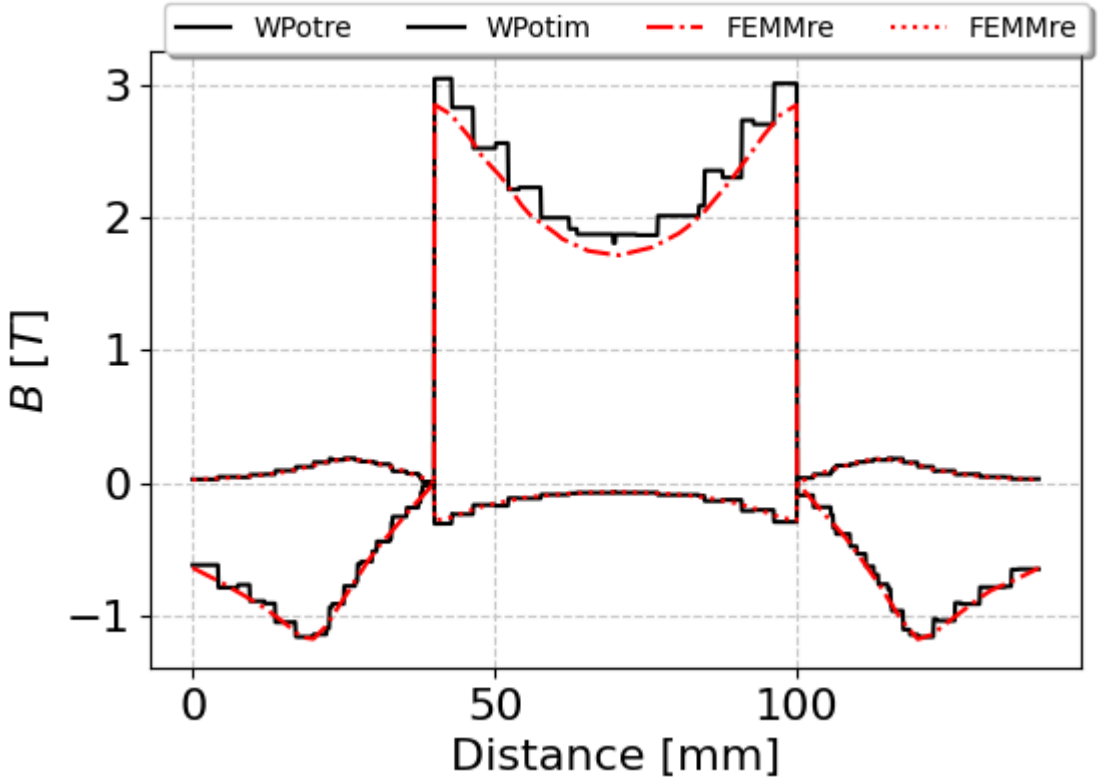
Half coil mesh parameters:



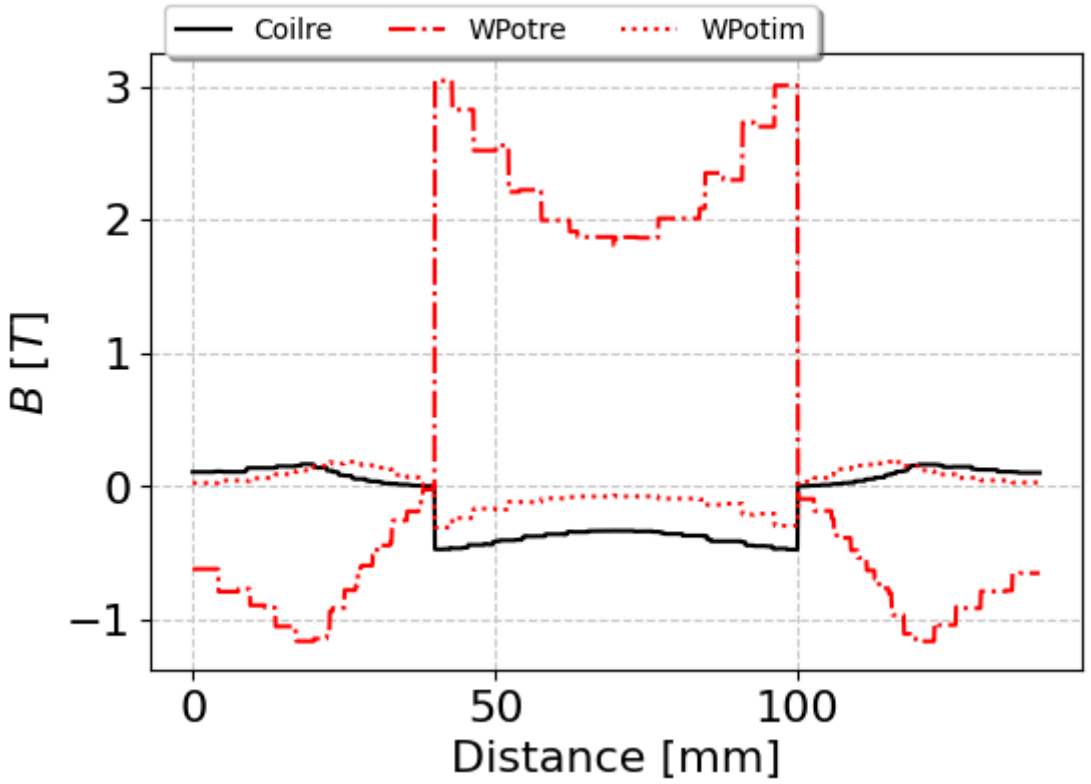
If the winding is stranded, everything is well behaved:



However, for the massive coil case, only WPotential solver converges.



Results from FEMM vs Elmer using massive coil without circuit:


Coilre
WPotre
WPotim
3
2
1
0
−1
B [T]
0
50
100
Distance [mm]