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Two-Scale Finite Elements for Laminates in NGS-Py

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The numerical simulation of power transformers is a challenging endeavour. Since a brute force 3D discretization exceeds available computing power, it requires the modelling of several components: The impressed currents in the windings, thin magnetic shields, small skin layers - and the laminated core and shields. We present some of the models we have developed together with our industrial partners over the last 15 years.

We present our software project Netgen/NGSolve with its new branch Ngs-Py, which allows a symbolic definition of equations using the Python scripting language. We discuss the general purpose components, and show how new models are added on top of Ngs-Py.

Keywords: Computational Electromagnetics, Two-Scale FEM