

SE-16.1 Comparative studies of numerical field calculation methods for the optimization of high voltage equipment (S)

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The paper will outline modern techniques for numerical field calculation that are utilised to improve and optimise existing high voltage equipment. This equipment is becoming increasingly important due to the changes in the Germany's energy supply system.

The paper deals with a detailed study of advantages and disadvantages of different field calculation methods like e.g. Finite Element Method (FEM), Charge Simulation Method (CSM), and Boundary Element Method (BEM). All methods presented in the paper can be utilised for the calculation of electrostatic fields in order to improve high voltage components.

By using basic but yet relevant examples, it will be demonstrated which methods are most efficient for the calculation of electric fields in high voltage equipment.

Furthermore, new techniques for optimisation of three dimensional fields and components will be presented using appropriate mathematical optimisation algorithms along with massive parallel computing technologies.

The authors are both experts in the area of numerical field calculation and have worked in for many years in this topic.