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MATHEMATICS AND NUMERICAL TECHNIQUES RELATED TO COMPUTATIONAL ELECTROMAGNETISM

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ABSTRACT

Computational electromagnetism plays important roles to design the electric facilities and to assess the influence of electromagnetic fields; for example, transformer, motor, and hyperthermic potentiation. However, as the ability of computers progresses and the demand of more precise approximation, the number of Degrees Of Freedom (DOF) of computational models derived from conventional discretizations becomes larger even in case of adaptive mesh. In this minisymposium, we make discussion on the development, accuracy, and efficiency of novel numerical schemes of electromagnetic field problems from both mathematical and engineering points of view.

We have some possibilities of novel numerical schemes, which are discussed in this minisymposium. First, we discuss efficient numerical schemes to compute directly such large scale computational models within the required computational costs, for example, based on Domain Decomposition Methods (DDM) with parallel computations; see [1]. Second, we discuss efficient numerical schemes reducing the problem size without deteriorating accuracy, which can be, for example, realized by Model Order Reduction (MOR) methods; see [2]. Third, we welcome to discuss novel schemes based on other strategies not mentioned above.

REFERENCES

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