JOHANNES KEPLER UNIVERSITY LINZ

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Talk announcement

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A posteriori error estimation for time-periodic eddy current problems

We present the multiharmonic analysis for a distributed eddy current optimal control problem and its state equation in a time-periodic setting. The existence and uniqueness of a weak space-time variational formulation for the optimality system and the forward problem are proved by deriving inf-sup and sup-sup conditions. Using the inf-sup and sup-sup conditions, we derive guaranteed, sharp, and fully computable bounds of the approximation error for the optimal control problem and the forward problem in the functional type a posteriori estimation framework. Similar estimates have been previously derived for the parabolic counterparts, however, the estimates for eddy-current problems are new. The work is important due to the range of applications regarding the simulations of electromagnetic devices. We present the first computational results on the derived estimates.