

Talk announcement

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Minimization of eddy currents in permanent magnets of an electric machine with shape derivatives

The presented work deals with the shape optimization of an electric machine considering time-dependent effects such as eddy currents. The considered electric machine is an interior permanent magnet synchronous machine and we minimize the average dissipated power due to the eddy currents in the magnets over a period of time corresponding to a rotation. Our approach is based on the computation of the shape derivative which – beside the computation of a sequence of state problems – also involves solving a sequence of adjoint equations. The challenge of this problem is related to the dependency of each one of the N adjoint equations on two different time steps, because of the finite difference used in the eddy current calculations.