

Space-Time Finite Element Methods in Moving Domains

Space-time discretization methods are well suited to handle moving domains in electric machines such as the electric motor. The space-time domain is discretized at once, and in contrast to time stepping methods no re-meshing is required. For the solution of the Maxwell equations in the electric motor we formulate a space-time finite element method, considering a two dimensional spatial domain and the temporal horizon as the third dimension. The space-time finite element method allows for a parallel iterative solution to compute the electric field. Accordingly, the torque and the iron losses can be computed for the electric motor.