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Disturbing vibrations and noise of electrical machines are gaining impact. Therefore, it is necessary to estimate the electromagnetic, structure-dynamical, and acoustic behaviour of the machine during designing and before prototyping. An adequate tool is numerical simulation applying the Finite-Element Method (FEM) and Boundary-Element Method (BEM) allowing for the structured analysis and evaluation of audible noise also caused by manufacturing tolerances. The methods developed and proved at the Institute of Electrical Machines (IEM) at RWTH Aachen University can be applied to any electromagnetic device in general.



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