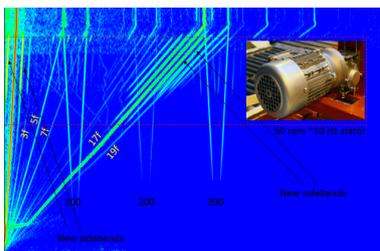


<https://eomys.com/services/articles/article/bruit-et-vibrations-des-machines-electriques>



Noise and vibrations of electric machines

- Services - Articles -



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EOMYS has an expertise in the analysis of **electromagnetically-excited acoustic noise and vibrations**, that is to say noise and vibrations due to electromagnetic fields, which includes [magnetic noise and vibrations of electrical machines](#) (from 100 W to 40 MW, 5 rpm to 150 000 rpm, outer and inner rotor topologies).

Electromagnetic excitations can have different origins: Maxwell or Laplace magnetic forces, magnetostrictive or electrostrictive forces, electrostatic forces, etc. They interact with the structural mechanics of some "active" systems (e.g. electromechanical actuators, rotating machines) and "passive" systems (e.g. capacitors, transformers, inductors, resistors).

This interaction can cause unpleasant acoustic resonances ("humming noise" or "whining noise"), harmful vibration levels, and mechanical fatigue. These Noise, Vibration, Harshness (NVH) issues can be found in the following sectors:

- [automotive](#) (e.g. electrical powertrain, small actuators)
- [railway](#) (e.g. traction motors, transformers)
- [naval](#) (e.g. propulsion electric motors)
- [aeronautics](#) (e.g. flight actuators)
- [energy](#) (e.g. wind turbine generators)
- [industry](#) (e.g. pumps, fans, elevators)
- [home appliances](#) (ex: electronic display, fluorescent lamps, hard disc drives, induction heating, electric curtains)
- [health appliances](#) (ex: dental surgery tools)

EOMYS can **troubleshoot and solve e-NVH issues after manufacturing and at design stage**, in particular by developing [multiphysical models](#), running electro-vibro-acoustic [experimental tests](#) and providing technical [trainings](#).

EOMYS has developed some specific numerical simulation tools taking into account both **Maxwell and magnetostriction forces** in active and passive components.

For the acoustic noise induced by Maxwell forces in rotating machines, EOMYS develops and distributes a **dedicated software called [MANATEE](#)**. This software is dedicated to the diagnosis of magnetic noise issues in electric machines, and to design low-noise machines during both basic and detailed design phases.