



*“Gheorghe Asachi” Technical University of Iasi, Romania*



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## **EVALUATION OF THE IMPACT OF ENVIRONMENTAL HAZARDS ASSOCIATED WITH MECHANICAL FAULTS IN BLDC ELECTRIC MOTORS**

**Szymon Gontarz\*, Przemyslaw Szulim**

*Warsaw University of Technology, Institute of Vehicles, 02-524 Warsaw, ul. Narbutta 84, Poland*

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### **Abstract**

The aim of this study was to determine the effect of selected defects, typical for BrushLess Direct-Current motor (BLDC), on the emission of magnetic field of working motor. Due to their very favorable parameters, motors with permanent magnets have been used in many applications. This brings them into close contact with humans, exposing humans to a potential source of excessive vibration, noise and alternating magnetic fields, which may adversely affect human health. One of the more common applications is electric cars and hybrids, where the person remains in relatively close contact to the BLDC motor. The exact parameters of the magnetic field and the exposure time for the human have been clarified by the relevant standards. It is known that human tissue exposure to a magnetic field for a certain time can lead to permanent changes or damage. Strong magnetic fields that occur in many electrical machines during normal operation are not dangerous to humans because they are in closed magnetic circuits. Damage may occur due to factors such as asymmetry of the magnetic field, which can allow part of the generated field to get past the magnetic circuit that is trapped inside the machine. This situation could become a threat to human's health if considerably implemented. The research includes laboratory experiments with a BLDC motor as well as magnetic measurement with up to date vehicles. Accurate results, analysis and conclusions from the authors will point to the importance of the issues in the era of electric and hybrid vehicles.

*Key words:* BLDC motor, electric vehicles, hybrid vehicles, magnetic flux risk

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\* Author to whom all correspondence should be addressed: e-mail: [sgontarz@simr.pw.edu.pl](mailto:sgontarz@simr.pw.edu.pl); Phone: +4822 234 8511; Fax: +4822 234 8121