



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



---

## **STUDY OF A DIRECT CURRENT (DC) MACHINE USED ON AUTOMOTIVE LOW ENVIRONMENTAL IMPACT APPLICATIONS**

**Radu Hanganu\*, Adrian Munteanu, Alecsandru Simion,  
Leonard Livadaru, Adrian Malanciuc, Bogdan Anghel**

*“Gheorghe Asachi” Technical University of Iasi, Faculty of Electrical Engineering,  
51-53 Dimitrie Mangeron Blvd., 700050 Iasi, Romania*

---

### **Abstract**

Issues related to environmental pollution, the greenhouse effect and fuels exhaustion have resulted in research on the implementation of electric and hybrid (vehicles provided both with electric motor and combustion engine) vehicles. This paper presents a study upon the electric motor that drives hybrid vehicles by analyzing its use under generating duty after the change of the power scheme that allows the transformation of the mechanical energy taken from a prime motor (combustion engine, electric motor, wheels moving vehicle during braking) into electrical energy used for auxiliary consumers. Experimental data confirm the efficient use of analyzed machine as starter and the possibility of its use as a generator (alternator). The speed adjustment has been studied in a machine operating as motor, for vehicle traffic adaptation depending on working conditions. The main characteristics come from data acquisition procedure, which uses the LabVIEW environment. We analyzed dynamic braking mode, which appears during quick stops, when the electric machine turns to generating duty and feed the auxiliary power consumers.

*Key words:* data acquisition, environmental pollution, greenhouse effect, hybrid vehicles, starter-alternator

*Received: December 2011, Revised final: August 2012, Accepted: September 2012*

---

---

\* Author to whom all correspondence should be addressed: e-mail: [raduhanganu@yahoo.com](mailto:raduhanganu@yahoo.com); Phone: +40740093082