



“Gheorghe Asachi” Technical University of Iasi, Romania



COMPARATIVE ANALYSIS OF THE EXTREMELY LOW-FREQUENCY MAGNETIC FIELD EXPOSURE FROM OVERHEAD POWER LINES

Eduard Lunca*, Marcel Istrate, Alexandru Salceanu

*“Gheorghe Asachi” Technical University of Iasi, Faculty of Electrical Engineering, 21-23 Prof. Dr. Doc. D. Mangeron Street,
700050 Iasi, Romania*

Abstract

The aim of this study is to carry out a theoretical investigation of the extremely low-frequency (ELF) magnetic fields produced by typical configurations of overhead power lines of the Romanian power grid. The computation of the magnetic flux density is achieved by the following two approaches: i) using an interactive LabVIEW program developed on fundamental formulas and ii) by numerical modeling with FEMM 4.2, a software package based on the finite-element method. Analytical results are then compared to numerical results and both are checked against national and international ELF exposure guidelines.

Key words: analytical computation, finite-element method, magnetic fields, overhead power lines

Received: February 2013; Revised final: June, 2013; Accepted: June, 2013

*Author to whom all correspondence should be addressed: E-mail: elunca@ee.tuiasi.ro; Phone:+ 40.232.278680/1246; Fax:+ 40.232.237627