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DEVELOPMENT OF A SYSTEM FOR ANALYZING THE ELECTROMAGNETIC RADIATION CAUSED BY THE CT SCANNER

Abstract: *In this paper a system for magnetic field measurement, graphical representation of measured data and its acquisition is described. The main goal of this system is to provide a possibility for analyzing non-ionizing electromagnetic radiation caused by the CT (Computer Tomography) scanner in its operational mode. In that purpose a three axial magnetic field sensor is used, while appropriate printed circuit board and PC desktop application are developed. Also, one CT scanning procedure is recorded at Clinical center of Kragujevac and those results are presented and discussed. The conclusions made here are of great importance for physicians and their patients who are exposed to such form of radiation, in order to estimate the health risks of exposure to CT scanner non-ionizing electromagnetic radiation.*

Keywords: *computer tomography, non-ionizing electromagnetic radiation, magnetic field sensor.*

1. INTRODUCTION

The whole living world is daily exposed to the influence of the electromagnetic field of a wide frequency range, from a few Hz to several GHz. Electromagnetic fields that surround us are either of natural origin such as geomagnetic, interplanetary magnetic field, atmospheric electric fields, cosmic rays, etc., or are caused by human activities. Today, there is no doubt that the biosphere has fields and radiation of all frequency ranges, from low frequencies such as periodical changes in magnetic and electric fields of the Earth to high frequency gamma radiation. However, the intensity of artificial electromagnetic fields significantly exceeds the intensity of natural electromagnetic fields. Artificial sources of electromagnetic fields are power plants,

transmission lines and transformers, consumers of energy distribution networks such as telecommunication systems, industrial equipment, electrified urban transport, computers, mobile devices, home appliances, medical diagnostic instruments, etc.

Electromagnetic radiation represents a fundamental phenomenon of electromagnetism. It is manifested as electromagnetic waves propagating through space or as photon particles traveling through space, carrying radiant energy. The amount of energy deposited by electromagnetic radiation and the form of its absorption is determined by the frequency and type of incident radiation and by the nature of the tissue that absorbs it [1]. According to its effects on the organism, electromagnetic radiation can be divided between ionizing

