Determinations of a Dosimetric Method Sensitive to Background Changes within an Urban Environment

Eugenia Yeboah¹, M.V. Sergeev¹, I.R. Sagov¹, G.A. Yakovlev¹, Mac-Donald Prince¹, Adams Benjamin Addo¹

¹Tomsk Polytechnic University, Tomsk, Russia

eugeniayeboah64@gmail.com

Wherever we are, we are exposed by natural radiation. Inside the urban environment there are many sources of natural and man-made radiation. Thus, it is important to know about background radiation levels in various places in the urban environment. Monitoring of radiation background is carried out mainly using dosimeters based on gas-discharge counters. However, their low detection efficiency of gamma radiation casts doubt on the possibility of detecting background changes. In this work the study of variations in background radiation was carried out using two devices BDKG-03 and DRG-01T1, which are based on different dosimetric methods. The main goal was to determine a dosimetry method that would be sensitive to low-background changes within the urban environment, and also provide statistically significant material for the search for anthropogenic anomalies. A study of the radiation background was carried out in Tomsk, and simultaneously by different dosimeters. The duration of one measurement was 5 minutes, which allowed us to obtain a standard deviation of the measurement result within 2-3% for BDKG-03, based on the scintillation method of dosimetry. For each dosimeter, calculation and comparison of arithmetic mean values and standard deviation at each point were made. The results confirming that dosimeters based on gas-discharge counters do not correspond to the task, despite their widespread use.

1. Speaker – Eugenia Yeboah (22 years old)
2. Email address, postal address, contact telephone number – eugeniayeboah64@gmail.com, 634034, Tomsk Vershinina 48, +7 929 3715399