Assessment of natural radiation levels in Korça using Gamma Spectrometry and Kriging Method

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Abstract

This study aimed to determine the levels of natural radiation in Korça by scanning urban and rural roads using the portable gamma spectrometer Atomtex AT6101C. For this purpose, 25,000 measurements were conducted, with values ranging from 15 nSv/h to 210 nSv/h, and an average of 54 nSv/h. The data were processed using computer programs like ArcGIS and MATLAB to improve accuracy and homogenize the measurements. The use of the Kriging method allowed for the interpolation of measurements, ensuring full coverage of the city with an accuracy of 5%. The measurements did not follow a specific distribution but were closer to a lognormal distribution. Compared to Serbia, Montenegro, and Bosnia-Herzegovina, where radiation levels ranged from 34.5 nGy/h to 97.6 nGy/h, with an average of 66.8 nGy/h, Korça showed lower average radiation levels but a higher maximum value. Compared to the European Union and the global average of 2.4 mSv/year, the measured values are within the permissible limits. These findings will contribute to the overall annual radiation dose assessment in Albania and provide a reference for radiological mapping across the country.

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