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VARIABILITY OF RADON AND THORON EQUILIBRIUM FACTORS CLOSE TO THE WALL IN INDOOR ENVIRONMENTS OF BANJA LUKA CITY (REPUBLIKA SRPSKA)

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This paper presents the results of radon and thoron equilibrium factors obtained from long term measurements of concentrations of radon, thoron and their progeny in different indoor environment of Banja Luka city (Republic Srpska). The measurements were made in 35 dwellings and 24 schools using CR-39 and LR-115 nuclear track detectors, exposed from April 2011 to May 2012. In schools the detectors were positioned about 8 – 10 cm away from walls and surfaces which are potential sources of thoron exhalation, whereas this distance was about 3 – 10 cm in dwellings. The obtained results for equilibrium factors can be described as log-normally distributed. The geometric mean values (and geometric standard deviations) of radon and thoron equilibrium factors were 0.17 (1.9) and 0.010 (2.2), respectively. The statistical analysis shows that the difference between radon equilibrium factor obtained for dwellings and schools was not significant. The geometric mean (geometric standard deviation) of thoron equilibrium factors in dwellings, i.e. 0.013 (2.0), is higher than the one in schools, 0.008 (2.2), and this could be related to the small differences in the detector positions with respect to the wall in schools and in dwellings. The influences of the distance of the detector from the wall, as well as the ones of the floor level, building materials and room type on equilibrium factor were analyzed.

Key words: CR-39 detectors, LR-115 detectors, DRPS/DTPS, radon, thoron, radon equilibrium factor, thoron equilibrium factor; schools, dwellings, Banja Luka City area, Republic of Srpska

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