

Radon anomalies as precursors of a recent earthquake: A case study of Kosovska Mitrovica environment

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Spike-like peaks in the concentration of radon gas prior to a major earthquake are attributed to release different gases (CO_2 , CH_4 , H_2S , SO_2 , H_2 suitable for the transport of radon to the earth's surface) due to pre-seismic stress or fracturing of the rock. Passive radon technique based on charcoal canister test kit conducted in the environment of Kosovska Mitrovica in summer and autumn period showed inexplicable results. Since radon levels are sensitive to short-term fluctuations, an active technique for indoor radon monitoring was performed with RAD7 device (DurrIDGE Company Inc.) in two selected sites (at 2 km distance) from 11-13 November 2019. Radon results for one measuring site in two proceeding days varied: from 103 ± 44 Bq/m³ during the afternoon; then strongly increased to 2843 ± 217 Bq/m³ in the midnight, afterward dropped to 1449 ± 104 Bq/m³ in the morning over the time scale of one day. These radon anomalies occurred within 1 hour for another site: from 200 ± 94 Bq/m³ to 2146 ± 262 Bq/m³ and radon values abruptly decreased in another day to about 40 Bq/m³. We consider that these changes in radon levels have been precursors of an earthquake of $M_L=6.4$ which occurred in Albania (41.315°N , 19.479°E , $H = 7$ km), approximately 13 days later. It was preceded by a few weaker earthquakes ($M_L > 4.0$), and a series of small earthquakes still appearing. The existence of deep fault zone and seismotectonic zone in Kosovska Mitrovica environment allow radon transport through fissures due to pressure gradient. These results showed that indoor radon measurement can be a useful predictor in an earthquake occurrence, even at a distance of 200 km.