

Assessment of the Tectonic Effects on Soil Radon Activity along the Margin of the Arabian Plate Boundary in Northwestern Syria

Authors : Mohamed Al-Hilal

Abstract : The main purpose of the present study is to assess the role of active tectonics in influencing the emanation level of soil radon across two tectonically active structures of the Northern Dead Sea Fault (NDSF) in northwestern Syria: namely, the Qastoon and Al-Harif fault segments. The radon measurements were basically directed by the results drawn from earlier studies of archaeoseismic and paleoseismic investigation in Al-Harif, besides integrated geophysical and morphotectonic survey at the Qastoon site. In view of that, a total of 80 soil gas radon points were measured in this work with a sampling depth of 75 cm, using the AlphaGUARD PQ 2000Pro radon detector. The background range of normal radon emission from local soil was determined in area located away from the influence of the tectonic disturbances. The obtained radon data were statistically analyzed, and the mean values have been standardized in terms of probability of magnitude, which enhances the comparison process and so facilitating the separation of normal radon variations from other anomalous or geotectonic related values. The overall results revealed remarkable occurrences of fault-associated radon anomalies with maximum peak values of ~6 to 7 times above the background, trending in accordance with the predicted traces of the fault ruptures at the Qastoon and Al-Harif, respectively.

Keywords : soil gas radon, active tectonic structure, northern dead sea fault, western Syria

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