



Scale-based analysis of simultaneous γ rays and α particles time series from subsurface radon

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Systematic subsurface radon monitoring can be performed using nuclear techniques, either with γ ray sensors based on scintillation crystals or with systems for detecting α particles. This work addresses the comparison of radon measurements obtained simultaneously with γ and α detection systems at the Bloch geophysical observatory, an horizontal deep tunnel in the Amran massif, southern Israel. High-quality measurements at 15-minute temporal resolution and spanning a period of several years are examined. At the daily scale the radon concentration as evaluated from γ emissions follows the concentration from α particles with a delay of 45 min. For time scales longer than 1 day, the temporal pattern recovered by the γ and α sensors is very similar. However, on shorter time scales (up to 8 hours), marked differences are found in the variability structure of the γ and α time series.