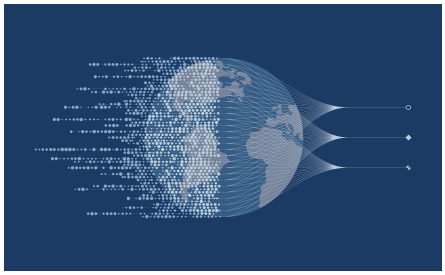

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Seismicity, tectonics and radon emission measurements in central Ionian Islands (Greece)

Friday 12 September 2025 10:00 (1 hour)

In the Ionian Islands, historical records dating back to 1400 A.D. reveal a recurring pattern of large earthquakes (Mw>7.0) involving multiple fault rupturing, complex rupture dynamics, and/or the triggering of additional earthquakes. Efforts to mitigate future casualties and economic losses require detailed investigations into past destructive earthquakes and seismic hazard assessments at finer resolutions. Over the past two decades, significant advancements in the region's seismic network have led to highly accurate earthquake relocations and a refined understanding of fault networks. It has become evident that recent main shocks are associated with specific fault segments, which subsequently transfer stress to neighboring faults. Active faulting, manifested by high seismic activity, combined with fluid flow, plays a critical role in the transport and dispersion of radionuclides. Radon (^{222}Rn), a radioactive noble gas with a half-life of 3.8 days, emanates from the upper lithosphere because of the alpha decay of radium (^{226}Ra) in the uranium-238 decay series. Once dissolved in water, radon distribution becomes particularly relevant for scientific investigations. The installation of novel sensor systems in the study area is expected to provide new insights into the correlation between imminent earthquakes and variations in radon emissions.

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