

Comparative Stress Field Analysis in the Durrës Region, Albania: Ambient Tectonic Stress versus the November 26, 2019 Mw 6.3 Seismic Sequence

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We present a comparative stress field analysis in the Durrës region of Albania based on three datasets: (i) two regional focal mechanism datasets (dr_planA and dr_planB) inverted using GISOLA and StressInverse v1.1.3, and (ii) moment tensor solutions from the November 26, 2019 Mw 6.3 Durrës earthquake sequence provided by the National Observatory of Athens. For each dataset, we estimate the principal stress orientations (σ_1 , σ_2 , σ_3), shape ratio φ , and friction coefficient μ . The regional field shows a stable NW–SE compressional regime with high friction ($\mu \approx 0.95$) and moderate differential stress ($\varphi \approx 0.75$). In contrast, the 2019 seismic sequence displays increased differential stress ($\varphi \approx 0.55$) and lower friction ($\mu \approx 0.45$), consistent with coseismic weakening and transient stress redistribution. Additionally, a stress analysis for the Mw 6.3 mainshock using the TENSOR program confirms a dominant reverse faulting mechanism with NW–SE compression. Our results reveal both the persistence of the Adriatic–Albanide compressive regime and the significant perturbation induced by the Mw 6.3 rupture, providing insights into earthquake mechanics and stress evolution in active collision zones.

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